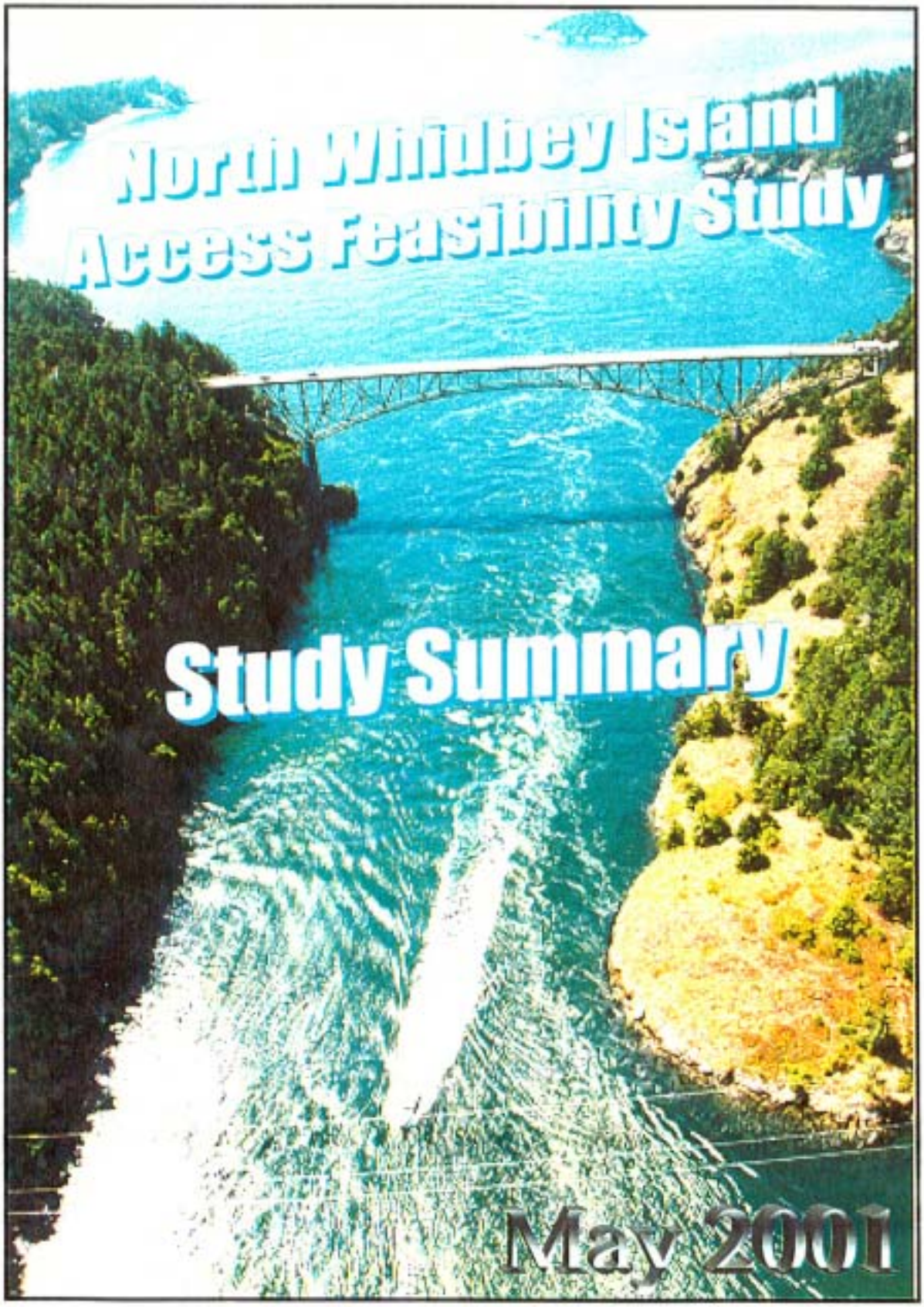

Washington State
Department of Transportation

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Executive Summary

Introduction

The SR 20 North Whidbey Island Access Feasibility Study was initiated to explore possible options to provide additional vehicular access to North Whidbey Island. The most recent update to the Island County Comprehensive Plan indicated that future traffic volumes at the SR 20 Deception Pass Bridge would overload the existing bridge capacity during the peak period with traffic that is approximately double current levels. The current route for SR 20 runs through Deception Pass State Park. The Deception Pass/Canoe Pass Bridges are listed as historic landmarks. As such, any widening of the SR 20 facility at the north end of Whidbey Island would be constrained by 4F regulations regarding impacts to parks and significant cultural resources. WSDOT and Island County embarked on this study to identify any feasible alternatives that would connect SR 20 to Interstate 5 to resolve the future traffic challenges.

Goals and Objectives

The primary goal of the SR 20 North Whidbey Island Access Feasibility Study was to determine the feasibility of increasing vehicular capacity by ferry and bridge access alternatives from North Whidbey Island to the mainland and I-5 corridor. Key tasks of the study process were:

1. To evaluate potential locations for:
   - New bridge connection from North Whidbey Island to the I-5 corridor
   - Additional vehicular ferry service/facility between Whidbey Island and the mainland/Stanwood or Camano Island.
2. To identify feasible alternatives from the potential locations for the expansion of the existing transportation network serving on-/off-island travel from Whidbey Island.
3. To provide feasibility analysis for further consideration in the update of local and regional plans.

The major objectives of this study were:

A. To identify potential and feasible sites for bridge construction from North Whidbey Island to the mainland, possibly across Fidalgo Island, Fir Island, or Camano Island.

B. To identify possible construction types for bridge alternatives.

C. To identify feasible locations for ferry system terminals for ferry alternatives.

D. To estimate vehicular travel demand for new access connections from North Whidbey Island, for either roadway or ferry network additions.

E. To provide an assessment of traffic impacts expected from addition of either bridge connection or ferry connection to and from North Whidbey Island.

F. To identify environmental, land use, economic and social aspects related to construction of either bridge or ferry systems connections.

G. To provide planning level construction cost estimates for feasible access alternatives.

The key objective of this feasibility study was to determine if there is one or more viable alternatives worth spending an estimated $7.5 million for an environmental impact study (EIS).

Committees

Two multi-jurisdictional committees were formed to guide the North Whidbey Island Access Feasibility Study. The *Technical Steering Committee* included representatives from the local governments (counties and cities) affected by proposed transportation improvements, as well as regional, state, and federal agencies who would likely be involved in any subsequent review of access alternatives. The *Policy Committee* included elected representatives from affected counties and major cities.

Through this study, the Technical Committee made recommendations to the Policy Committee, which made recommendations to the Policy Boards for actions and decisions. The Technical Steering Committee met with the project team six times to provide input for the study process and decision-making guidance for the study work elements. The Policy Committee met three times during the NWIAFS. It reviewed preliminary input from the Technical Committee and the community on a wide range of possible access alternatives and recommended to WSDOT and the regional policy committees (Island Sub-RTPO, Snohomish County Tomorrow, Skagit Sub-RPTO) the five access alternatives to evaluate in greater detail. They also met to make final recommendations to the Policy Boards.

Public Involvement

Community input concerning the alternatives to be analyzed for feasibility was obtained from four avenues: community open houses, key person interviews, community survey, and extensive media coverage.

Identification of Bridge and Ferry Options

A field review and review of topography and roadway connections revealed a collection of possible locations for bridge and ferry landings on Whidbey Island, Camano Island and the mainland in Skagit and Snohomish Counties. Initial screening was performed at Technical Committee Meeting #2 using the five criteria for feasibility (Social, Cost/Financial, Land Use/Economic Development, Environmental and Transportation Performance) and reflecting a general knowledge of the study area provided by both the consulting team and the collective Technical Steering Committee knowledge. The alternatives selected for final review were:

Alternative 1: Bridge from vicinity of Dugualla Bay to vicinity of La Conner
Alternative 2: Bridge from north Strawberry Point to Conway via Fir Island Road
Alternative 3: Bridge from Strawberry Point to vicinity north of Stanwood
Alternative 4: Ferry Operation to North Whidbey Island

Feasibility Assessment of Alternatives

Criteria and Measures of Feasibility (MOF) were selected for this project by the Technical Steering Committee. The Technical Committee at the November 1, 1999 meeting made a recommendation that all of the four alternatives evaluated are not feasible for implementation as vehicular capacity access to North Whidbey Island. This recommendation is based on rating of four of the five criteria for assessing feasibility of the alternatives. On April , 2000, the Policy Committee approved the final recommendations for forwarding to the Policy Boards. On April 19, 2000, the Skagit Sub-Regional Transportation Planning Organization (SRTPO) approved the recommendations with the understanding that the issue would have to be revisited in the future as need increased, probably in five to eight years.

The Policy Board members also recognized that the design life of the Deception Pass Bridge was approaching. Although WSDOT engineer's have extended the useful life of the bridge, it will eventually have to be replaced. When this occurs, the bridge could be closed for approximately one and one half years. A new structure could serve as access until the current structure was replaced.

As an information item the Policy Board was advised that the determination of non-feasibility of all alternatives could open the door to revisiting an alternative at or near the current local. Section 4F prevents the taking of parklands for highway purposes, unless there are no feasible alternatives. Any such considerations would have to minimize impacts. A possibility is a tunnel under the park.

The Island County SRTPO Policy Board approved of the recommendations on April 26, 2000 and the full RTPO approved of them on June 14, 2000 with the same qualifiers and understandings.

Summary of Project Process and Alternatives Evaluation

The SR 20 North Whidbey Island Access Feasibility Study was initiated to explore possible options to provide additional vehicular access to North Whidbey Island. The most recent update to the Island County Comprehensive Plan indicated that future traffic volumes at the SR 20 Deception Pass Bridge would overload the existing bridge capacity during the peak period with traffic that is approximately double current levels. The current route for SR 20 runs through Deception Pass State Park. The Deception Pass/Canoe Pass Bridges are listed as historic landmarks. As such, any widening of the SR 20 facility at the north end of Whidbey Island would be constrained by 4F regulations regarding impacts to parks and significant cultural resources. WSDOT and Island County embarked on this study to identify any feasible alternatives that would connect SR 20 to Interstate 5 to resolve the future traffic challenges.

The outcome from this study will be incorporated into the next Comprehensive Plan update for each of the affected counties and areas. Any new facility would be included as a toll facility. With respect to concurrency requirements, the County is required to meet concurrency requirements on SR 20.

The purpose of this summary is to provide a guide to the work accomplished by the study team, including consultant efforts, preceding the loss of funding for the study as a result of the November 1999 election and passage of Initiative 695. The project was initiated in August 1998 and is close to conclusion with draft/pending recommendations regarding alternative feasibility that were developed by the Technical Steering Committee in November 1999. Attached is a set of three appendices that include copies of the products of the study for both process and evaluation of alternatives.

Project Team

Jean Mabry and Mark Sinden of WSDOT Northwest Region Mount Baker Planning District staff have provided project management and guidance through the project in conjunction with Jerry Schutz, Planning Manager and Bob Josephson, Mount Baker Area Administrator. The consultant team supporting this planning effort consisted of Parametrix, Inc. as prime consultant with five sub-consultants to provide expertise as follows: HWA Geosciences for geotechnical and soils engineering, Larson Anthropological Archaeological Services for investigation of cultural resources, Lin & Associates for structural engineering and bridge concepts, McClure Consulting for public involvement and agency coordination, and Parsons Brinckerhoff for ferry planning and financial analyses. Katherine Casseday was consultant project manager. An organization chart of the consultant team is attached for reference.

Goals and Objectives

The primary goal of the SR 20 North Whidbey Island Access Feasibility Study was to determine the **feasibility** of increasing vehicular capacity by ferry and bridge access alternatives from North Whidbey Island to the mainland and I-5 corridor. Key tasks of the study process were:

1. To evaluate potential locations for:
   - New bridge connection from North Whidbey Island to the I-5 corridor

- Additional vehicular ferry service/facility between Whidbey Island and the mainland/Stanwood or Camano Island.

2. To identify feasible alternatives from the potential locations for the expansion of the existing transportation network serving on-/off-island travel from Whidbey Island.
3. To provide feasibility analysis for further consideration in the update of local and regional plans.

The major objectives of this study were:

A. To identify potential and feasible sites for bridge construction from North Whidbey Island to the mainland, possibly across Fidalgo Island, Fir Island, or Camano Island.

B. To identify possible construction types for bridge alternatives.

C. To identify feasible locations for ferry system terminals for ferry alternatives.

D. To estimate vehicular travel demand for new access connections from North Whidbey Island, for either roadway or ferry network additions.

E. To provide an assessment of traffic impacts expected from addition of either bridge connection or ferry connection to and from North Whidbey Island.

F. To identify environmental, land use, economic and social aspects related to construction of either bridge or ferry systems connections.

G. To provide planning level construction cost estimates for feasible access alternatives.

The key objective of this feasibility study was to determine if there is one or more viable alternatives worth spending $7.5 million for an environmental impact study (EIS). The feasibility study started out with a broad-brush regional planning process that identified the need for capacity improvements, the next step was the feasibility study to narrow down the many alternatives to those that are feasible for construction. Then the environmental and design process would go forward to select a preferred alternative for capacity improvements.

Concurrent with the NWIAFS, WSDOT staff was updating the Island County Sub-Regional Transportation Plan (SRTP). This plan is the first RTP in the state to incorporate a least cost planning methodology. The SRTP assumptions do not include any new vehicular capacity on and off the Island.

It is important that the SRTP effort has been coordinated with this feasibility study. The two studies complement each other in effort, and the key is the term *complementary*. The SRTP conclusions and recommendations were intended to be brought forward ahead of the feasibility study completion.

Committees

Two multi-jurisdictional committees were formed to guide the North Whidbey Island Access Feasibility Study. The *Technical Steering Committee* included representatives from the local governments (counties and cities) affected by proposed transportation improvements, as well as regional, state, and federal agencies who would likely be involved in any subsequent review of access alternatives. The *Policy Committee* included elected representatives from affected counties and major cities.

The role of the Technical Committee was to:

- Identify relevant issues for the Project Study Team
- Define study parameters (including recommending technically viable access alternatives for study; committee roles and interface with other policy and technical entities; reviewing community input procedures and results)
- Develop feasibility criteria against which to evaluate the access alternatives
- Evaluate the access alternatives for feasibility and make recommendations among the alternatives for policy consideration.

Through this study, the Technical Committee made recommendations to the Policy Committee, which made recommendations to the Policy Boards for actions and decisions. The Technical Steering Committee met with the project team six times to provide input for the study process and decision-making guidance for the study work elements. Seven meetings were planned to occur at times appropriate with the study work elements. Six meetings were held covering the evaluation of alternatives and the development of draft/pending recommendations regarding feasibility of alternatives. The Technical Steering Committee roster is included in Appendix A.

The Policy Committee met twice during the NWIAFS. It reviewed preliminary input from the Technical Committee and the community on a wide range of possible access alternatives and recommended to WSDOT and the regional policy committees (Island RTPO, Snohomish County Tomorrow, Skagit RPTO) the five access alternatives to evaluate in greater detail.

The Policy committee was originally envisioned as a decision making body. It became clear that the Policy Committee would be advisory to the three Policy Boards involved: Island County Sub-Regional Transportation Planning Organization Policy Board, Skagit County Sub-Regional Transportation Planning Organization Policy Board, and Snohomish County Tomorrow, a sub-regional policy board of the Puget Sound Regional Council. Both the technical committee members and the policy committee members need to return to their respective/parent bodies for direction and to provide feedback to the project team. Ultimately, the decision regarding the feasibility of alternatives for increased vehicular access to North Whidbey Island lies with the SIRTPO and the PSRC. The Policy Committee roster is included in Appendix A.

Public Involvement

Community input concerning the alternatives to be analyzed for feasibility was obtained from four avenues:

Community Open Houses: Three open houses were held at different locations in October 1998: South Whidbey, North Camano Island, and Oak Harbor, with a total of 39 people attending. These open house meetings were held in conjunction with open house meetings for the Island County Regional Transportation Plan Update. Due to low attendance at the three open house meetings, questionnaires were distributed to a collection of more than fifty organizations to solicit input on possible alternatives for evaluation. This effort (Community Survey noted below) was a successful outreach activity resulting in a significant response and direction for the alternatives development stage of the study.

Key Person Interviews: In-depth interviews were conducted among sixteen civic leaders to identify the social, economic, and environmental issues that are of concern to the potentially affected communities, due to either enhanced access to North Whidbey or continued poor access.

A Community Survey was conducted to achieve wide opportunity for residents of Whidbey Island, Camano Island, and (less broadly) Skagit County to comment on the range of alternatives that were initially proposed for feasibility analysis. Questionnaires were distributed using two different methods: first, 50+ community organizations were contacted and asked to participate in this community-wide effort by distributing copies of the questionnaire to their members; second, questionnaires were provided throughout the study area for pick-up (post offices, government offices, community centers, etc.). A total of 3000 questionnaires were distributed.

In response, 895 questionnaires were returned. These were tabulated quantitatively and the write-in comments were individually recorded. A written analysis of community input was prepared for the Study Team's and the Committees' use in determining which alternatives to carry forward for further analysis in the North Whidbey Access Feasibility Study.

In addition to these community input measures unique to this study, the Project Team undertook a re-analysis of a North Whidbey Island Origin/Destination Survey that was conducted in April1998. Much of the information from that survey was germane to the North Whidbey Access Feasibility Study, but had not been fully data coded at the time of its original use.

Extensive media coverage, with pre-survey information and then results of the Community Survey was distributed to every local newspaper in the tri-county area. This resulted in a lively printed discussion of the community issues relevant to the study.

The second set of open house meetings would follow completion of a draft feasibility report, however the effort for a draft report and completion of the study has been truncated in consequence of the passage of Initiative 695 and restriction of funds for this study.

Project Sequence and Process

The study was organized around a series of technical steering committee and policy committee meetings, starting with identification of project purpose, goals and objectives, baseline assumptions, identification of alternatives, preliminary screening, and evaluation of feasibility. What follows is a sequential review of the study with note of key topics of discussion, analysis and decisions through the project leading to the presentation of feasibility evaluation and preliminary conclusions of feasibility for each alternative.

Project Agency Scoping Meeting

The combined technical committee and policy committee memberships for the project met in September, 1998 to discuss the overall project scope, the goals and objectives of the project and to start a discussion of possible alternatives for consideration through this study process. Meeting notes are included in Appendix A.

Initial Identification of Bridge and Ferry Options

A field review and review of topography and roadway connections revealed a collection of possible locations for bridge and ferry landings on Whidbey Island, Camano Island and the mainland in Skagit and Snohomish Counties. These possible locations were combined with input

from the public via the public open house and public outreach effort to create a collection of connection options for initial screening by the Technical Steering Committee and the Policy Committee for the project. Initial screening was performed at Technical Committee Meeting #2 using the five criteria for feasibility (Social, Cost/Financial, Land Use/Economic Development, Environmental and Transportation Performance) and reflecting a general knowledge of the study area provided by both the consulting team and the collective Technical Steering Committee knowledge. This initial screening was a qualitative assessment, with several options eliminated due to social or cultural constraints and transportation performance. A coverage of the initial screening process is detailed in the meeting notes for Technical Committee Meeting #2.

Description of Alternatives for Feasibility Evaluation

See page 9 for vicinity map of the following four alternatives.

Alternative 1: Bridge from vicinity of Dugualla Bay to vicinity of La Conner
Roadway improvements would extend from SR 20 along Frostad Road to Dugualla Bay, a 4.8 mile bridge would cross Skagit Bay between Goat and Ika Islands and land near the north edge of the North Fork Skagit River delta. The route would then continue along Dodge Valley Road, Best/Chilberg Road, to cross the North Fork Skagit River south to Fir Island Road, and follow Fir Island Road through Conway to I-5.

Alternative 2: Bridge from north Strawberry Point to Conway via Fir Island Road
Roadway improvements would extend from SR 20 along Fakkema Road to Silver Lake Road, or from SR 20 along Crescent Harbor Road to Silver Lake Road, a 4.0 mile bridge would cross Skagit Bay from Strawberry Point to a landing at Fir Island Road, then cross Fir Island to Conway at I-5.

Alternative 3: Bridge from Strawberry Point to vicinity north of Stanwood
East from SR 20 on new alignment to Crescent Harbor Road, follow Crescent Harbor Road to new alignment to Strawberry Point Road, then a 6-mile bridge over Skagit Bay heading southeast to SR 530 on new alignment, and east along 300th Street NW to I-5 interchange.

Alternative 4: Ferry Operation to North Whidbey Island
A ferry run from Whidbey Island to a terminal located at the west end of a bridge extending out into Skagit Bay. The ferry would depart from a new ferry terminal located near Strawberry Point, Oak Harbor, or downtown Coupeville. The eastside ferry terminal would be located on a 5.4-mile bridge/dock aligned with an 0.8-mile extension of 300th Street NW in the vicinity of North Stanwood.

Feasibility Assessment of Alternatives

Criteria and Measures of Feasibility (MOF) were selected for this project by the Technical Steering Committee. This process is detailed in meeting notes for Technical Committee Meeting #3. Listed below are descriptions of the methodologies used in evaluating the feasibility of the alternatives. A summary of the feasibility assessment and evaluation by criteria and measurement is attached.

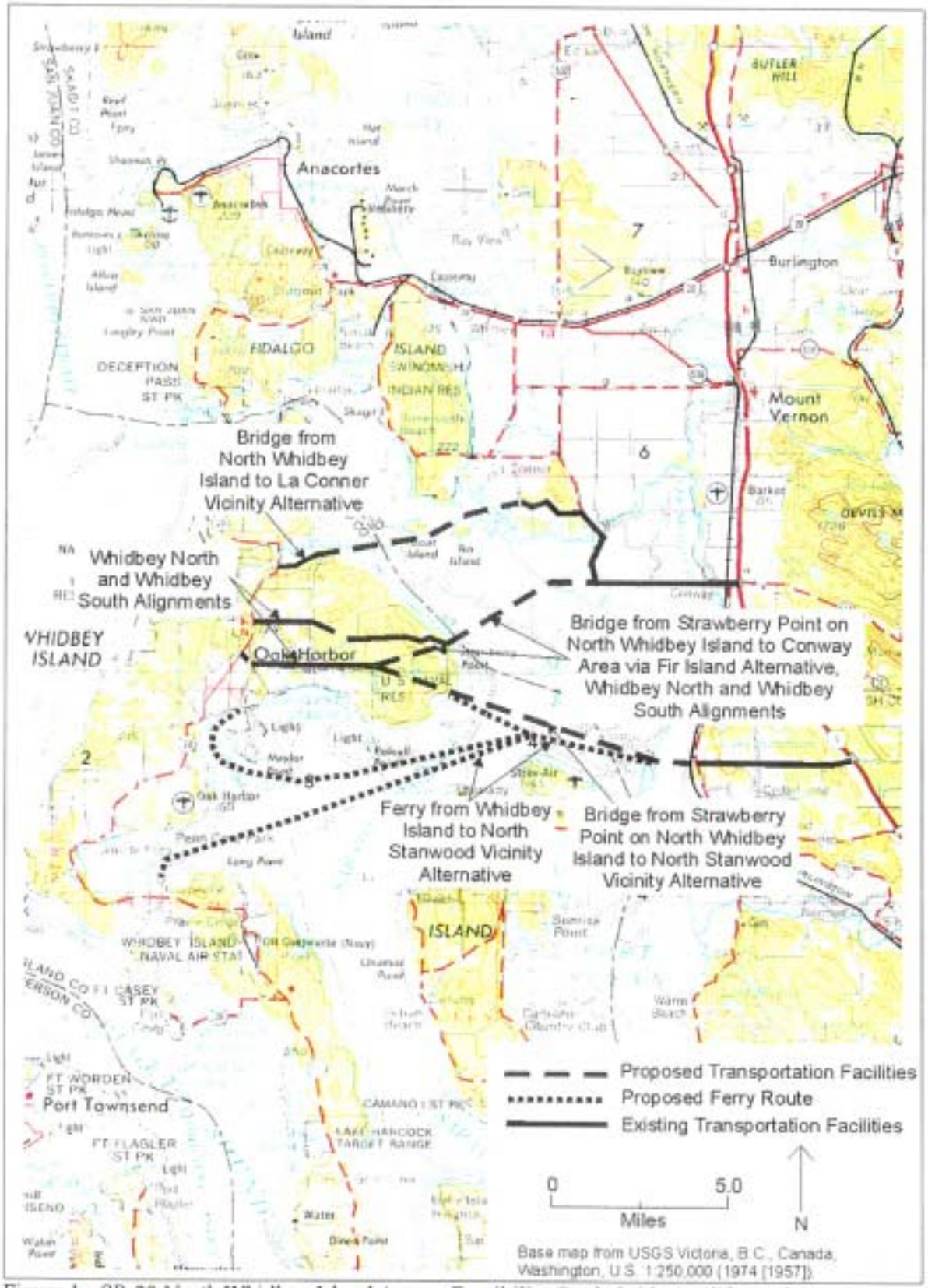

Figure 1. SR 20 North Whidbey Island Access Feasibility Study bridge and ferry alternative alignments with existing and proposed transportation facilities.

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Methodology

A Methodology for assessing the feasibility of each alternative was developed to address each of the five criteria for feasibility. Working closely with the project Technical Steering Committee, the project team identified measures within each criteria to help clarify if an alternative is feasible and worthy of further review or evaluation.

Community Impacts

Three MOF were developed to evaluate community social impacts: S1-impacts to cultural resources; S2-impacts to residences; and S3-traffic impacts on local neighborhoods. Potential impacts on cultural resources were assessed by conducting an inventory of the type and significance of historic and archaeological sites within ½ mile of each proposed alternative alignment. The inventory was conducted by Larson Anthropological Services Limited and summarized in a cultural resources technical report (Appendix B-1).

Potential impacts on residences were assessed by estimating the number of residences within ½ mile of each proposed alternative alignment using 1999 aerial photographs. Potential traffic impacts on existing neighborhoods were assessed by determining likely changes in roadway classification, non-arterial to arterial conversions, changes in speed limits, and changes in side street or property access that could result from the proposed alternatives.

The results of the evaluation are described in the *Social Impacts* by Parametrix (Appendix B-2), and summarized in the Summary of Technical Measures Table of this summary.

Land Use and Economic Impacts

Five MOF were developed to evaluate land use and economic development impacts:

- LU1-amount of agricultural land affected by right-of-way (ROW) acquisition.
- LU2-amount of timber and mineral resource land affected by ROW.
- EH3-ROW within shoreline jurisdiction.
- ED1-potential number of farms and businesses affected.
- ED2-potential impacts to fish and shellfish harvesting.

County land use and zoning maps were used to estimate the amount of designated agricultural land and the amount of designated timber and mineral resource lands that would need to be acquired for roadway ROW. Location of ROW within areas under shoreline jurisdiction were determined by review of county shoreline master plan maps.

Potential impacts on farms and businesses were assessed by estimating the number of farms and businesses within ½ mile of each proposed alternative alignment using 1995 aerial photographs. A site reconnaissance was conducted to verify the photograph counts.

Information regarding tribal and commercial fish and shellfish harvesting areas was obtained from several sources existing references and personal communications with Tribal and WDFW representatives.

The results of the evaluation are described in the *Land Use and Economic Development Analysis* by Parametrix (Appendix B-3).

Financial/Economic Performance

Three MOF were developed to assess alternative feasibility for financial and economic performance:

- FE1 Planning level construction cost estimate, including right of way and mitigation
- FE2 Annual operation and maintenance cost estimate
- FE 3 An assessment of funding potential, reflecting revenues from tolls and rate of return on private investment

Planning level construction, operations and maintenance cost estimates were developed for the three bridge alternatives and ferry operations alternatives considered for this project. Costs include the construction of bridge, the effective reconstruction of roadways connecting SR 20 to the bridge and to I-5, right of way through the corridor and intersection or interchange improvements at key locations. Please refer to the *Planning Level Cost Estimate* Technical Memorandum (Appendix B-4) for a more detailed description of the cost estimation parameters. Roadway construction costs were estimated using a baseline cost spreadsheet provided by WSDOT staff, reflecting the general terrain character of the routes and the adjacent land use (urban or rural) character along the alignments. Bridge construction cost estimates were developed by Lin & Associates and are described in the Bridge Analysis and Cost Estimates Technical Memorandum. Due to the length of the crossing, the bridge type would probably be a collection of 40-60' spans with low clearance through the Skagit Bay and mud flats area and longer spans to clear the shipping channel and deep water closer to Whidbey Island.

Capital and operating costs for ferry operations were developed by Parsons Brinckerhoff and are presented in the *Ferry Operations* Technical Memorandum for the project (Appendix B-5). There are several options for ferry operations, depending upon the location of the Whidbey Island terminal. The purpose of this study was to examine the feasibility of a ferry alternative, not the selection of a specific ferry run.

An assessment of financial feasibility was provided by Parsons Brinckerhoff for each alternative using cost input, traffic forecast input and some assumptions for public funding, (Appendix B-5). Financial feasibility for a bridge connection to North Whidbey Island depends upon the ability to attract investors into a public-private partnership.

Natural Environmental Impacts

Six MOF were developed to evaluate wetland, wildlife, and fisheries impacts:

- EH1-Location and type of priority habitat affected.
- EH2- Threatened and endangered species affected.
- EC1-Wetland affected.
- EC2-Eelgrass beds affected.
- EC3-Floodplains affected.
- EC4-Relative geotechnical risk.

The proposed alternatives were overlaid on National Wetland Inventory (NWI), Priority Habitat Species maps obtained from Washington Department of Fish and Wildlife (WDFW) and the Puget Sound Environmental Atlas to identify wetland, wildlife and fish resources that potentially could be affected by each alternative. Existing resources within 0.5 mile of the roadway were identified with particular attention paid to those resources in the direct path of the proposed right-

of-way. Resources that could be affected by the project were grouped into two categories: those that would be affected by improvement of existing roads, and those that would be affected by new construction. Impacts of new construction would likely be more significant. The results of the evaluation are described in the *Summary of Wetland, Wildlife, and Fishery Resources* by Parametrix (Appendix B-6).

Floodplain mapping prepared by Federal Emergency Management Agency (FEMA) for Island, Skagit and Snohomish Counties was used to evaluate the amount of ROW within the 100-year floodplain for each alternative under consideration. The results of the evaluation are described in the *Environmental Issues-Floodplain Review* by Parametrix (Appendix B-7).

Geotechnical risk was evaluated based on review of superficial geologic maps of the project area, a seismotectonic map of the Puget Sound Region, and a site reconnaissance. The results of the evaluation are described in the *Geotechnical Feasibility and Concept Study* by HWA Geosciences Inc. (Appendix B-8).

Transportation Performance

Three MOF were developed to measure transportation performance:

- TP1 Average Travel Time, Oak Harbor to Mount Vernon
- TP2 Average Travel Time, Oak Harbor to Everett
- TP3 Level of Service

A travel-forecasting model was developed by WSDOT transportation planning staff for the three county area to provide traffic volume and travel time data for this feasibility analysis. Transportation feasibility was assessed using two key measures, future roadway level of service and future travel time savings. Roadway level of service was evaluated at significant arterials throughout the study area for year 2020 peak hour traffic assignments from the model output for each of the four alternatives. Travel time savings, compared with a future no-action scenario, were identified for each of the alternatives for three origin and destination pairs: Oak Harbor to Mount Vernon, Oak Harbor to Everett and Oak Harbor to Anacortes. Travel time savings and improved peak hour level of service are both measures of the potential benefits associated with the alternatives being considered.

Model runs were provided for future no-action or baseline conditions, for future conditions with each alternative without toll, and for each bridge alternative under two toll scenarios, a high and low toll value. Toll values of $3.50 and $5.00 per trip were estimated based on the expected amount of time saved using a new bridge in consideration of local wage rates and values of time. The Transportation Performance Technical Memorandum outlines both the methodology and results of the analysis for the alternatives (Appendix B-9).

Evaluation of MOF Criteria, by Alternative

Bridge from North Whidbey Island to LaConner Vicinity

A detailed summary of expected impacts and costs of this alternative is presented in *SUMMARY OF FEASIBILITY MEASURES, Bridge from North Whidbey Island to Vicinity of LaConner,* (Appendix C-1).

Planning Level Construction Cost Estimate: $321.1 million including roadways, bridge, right of ways, and traffic mitigation. Operations and Maintenance costs for the project are estimated to be $1.360 million annually. Project level rate of return would range from –1.1% (negative return) to 1.4%, which would not be attractive to investors.

While there are expected travel time benefits expected with this bridge alternative, this alternative appears to be fatally flawed with respect to potential environmental impacts. Significant impacts are expected with this alternative on Federally listed threatened and endangered species as follows:

- Two crossings of the North and South Forks of the Skagit River with known large populations of threatened chinook, proposed threatened bull trout, and candidate coho salmon would result from this alignment.
- Eleven bald eagle nests in four bald eagle territories are within 0.5 mile of the alignment.
- Three and one-half mile of estuarine intertidal habitat along the east side of Skagit Bay and in Dugualla Bay would be potentially affected by bridge development. These areas are recognized as important wintering and staging habitat for waterfowl, as rearing habitat for threatened chinook salmon, and as breeding/rearing habitat for herring, sand lance, and smelt.
- Of the 3.5 mile length of bridge in the intertidal area, approximately 0.2 mile length through eelgrass habitat, an important habitat critical for supporting several priority fish species and other marine life. Eelgrass beds are considered to be irreplaceable and avoidance is the recommended mitigation.

These impacts would present serious obstacles for obtaining approval by the US Fish and Wildlife Service and National Marine Fisheries Service.

- At least 20 emergent, shrub-scrub, and forested wetlands located on Fir Island are potentially affected. Several riparian wetland habitats along the rivers and streams could be affected. Adequate mitigation may be achieved through avoidance and minimization measures.
- All of the alignment along Fir Island Road lies within the 100-year floodplain, including the interchange at I-5. Portions of the alignment through Dodge Valley would be within the area of flood risk. Compensatory flood storage would need to be provided for all area lost due to the project.

These impacts would present serious obstacles for obtaining permits.

- Construction would occur in designated shoreline areas. The Shoreline Master Programs of Skagit and Island Counties stipulate that roadway construction shall be located away from shoreline areas whenever feasible.

- Bridge construction would result in substrate modification in existing eelgrass beds within Island County shoreline jurisdiction, which is ***prohibited*** under Island County Shoreline Use Requirements (Section 17.05.045).
- Construction would occur within Shorelines of Statewide Significance including the Skagit County marine shoreline, Whidbey Island marine shoreline and the North and South Forks of the Skagit River. Shorelines of Statewide Significance are given higher priority for protection and preservation than other designated shoreline areas.

Bridge from North Whidbey Island to Fir Island and Conway Vicinity

Detailed summary of expected impacts and costs of this alternative are presented in *SUMMARY OF FEASIBILITY MEASURES, Bridge from Strawberry Point on North Whidbey Island to Conway Area Via Fir Island,* (Appendix C-2).

Planning Level Construction Cost Estimate: $183.4 million including roadways, bridge, right of ways, and traffic mitigation. Operations and Maintenance costs for the project are estimated to be $1.098 million annually. Project level rate of return would return would range from 3.4% to 3.7%, which would not be attractive to investors.

While there are expected travel time benefits expected with this bridge alternative, this alternative appears to be fatally flawed with respect to potential environmental impacts. Significant impacts are expected with this alternative on Federally listed threatened and endangered species as follows:

- The South Fork of the Skagit River and one stream that support threatened chinook, proposed threatened bull trout, and candidate coho salmon populations would be crossed by this alignment.
- Up to 4 bald eagle nests in 2 bald eagle territories are with in the 0.5 mile of the alignment.
- Two and one-half mile of estuarine habitat in Skagit Bay would be potentially affected by the alignment. These areas are recognized as important wintering and staging habitat for waterfowl, rearing habitat for threatened chinook salmon, and as spawning/rearing habitat for herring, sand lance, and smelt.
- Of the 2.5 mile of estuarine habitat crossed by the bridge, approximately 1.5 miles are through eelgrass habitat; an important habitat critical for supporting several priority fish species and other marine life. Eelgrass beds are considered to be irreplaceable and avoidance is the recommended mitigation.

These impacts would present serious obstacles for obtaining approval by the US Fish and Wildlife Service and National Marine Fisheries Service.

- At least 16 forested, emergent, and scrub-shrub wetland areas and open water habitat would potentially be affected by the alignment. One of the emergent wetlands along the Crescent Harbor Road alignment is a large system (80+ acres) recognized by Washington Department of Fish & Wildlife as a State priority habitat. Adequate mitigation may be achieved through avoidance and minimization measures.

- All of the alignment along Fir Island Road lies within the 100-year floodplain, including the interchange at I-5. Compensatory flood storage would need to be provided for all area lost due to the project.

These impacts would present serious obstacles for obtaining permits.

- Construction would occur in designated shoreline areas. The Shoreline Master Programs of Skagit and Island Counties stipulate that roadway construction shall be located away from shoreline areas whenever feasible.
- Shorelines of Statewide Significance that would be affected include Skagit Bay marine shoreline of Skagit County, the Skagit Bay marine shoreline of Whidbey Island, and the South Fork of the Skagit River in the project vicinity. Shorelines of Statewide Significance are given higher priority for protection and preservation than other designated shoreline areas.

Bridge from Strawberry Point to North Stanwood Vicinity, via NW 300th

A detailed summary of expected impacts and costs of this alternative is presented in *SUMMARY OF FEASIBILITY MEASURES, Bridge from Strawberry Point to North Stanwood Vicinity*; (Appendix C-3).

Planning Level Construction Cost Estimate: $260.3 million including roadway, bridge, right of ways, and traffic mitigation. Operations and Maintenance costs for the project are estimated to be $1.417 million annually. Project level rate of return would range from 5.8 to 6.6%, which would not be attractive to investors.

Significant impacts are expected with this alternative on Federally listed threatened and endangered species as follows:

- Two salmon-accessible streams would be potentially affected by the alignment.
- Three bald eagle nests in three bald eagle territories are within 0.5 mile of the alignment.
- Two and one-half mile of estuarine habitat in Skagit Bay would be potentially affected by the alignment. These areas are recognized as important wintering and staging habitat for waterfowl, spawning/rearing habitat for threatened chinook salmon, proposed threatened bull trout, and as spawning/rearing habitat for herring and smelt.
- Of the 2.5 mile of estuarine habitat crossed by the bridge, approximately 0.3 mile are through eelgrass habitat; an important habitat critical for supporting several priority fish species and other marine life.
- These impacts would present serious obstacles for obtaining approval by the US Fish and Wildlife Service and National Marine Fisheries Service.
- At least 60 emergent and forested wetland areas and open water habitat would potentially be affected by the alignment. One of the emergent wetlands is a large system (80+ acres) recognized by Washington Department of Fish & Wildlife as a State priority habitat. Adequate mitigation may be achieved through avoidance and minimization measures.

These impacts would present serious obstacles for obtaining permits.

- Approximately 2.5 mile of new roadway would be located in shoreline areas under Snohomish County jurisdiction, including tidelands. Crossing of tidelands, shorelands, and marshes, bogs, or swamps for roads and railroads is prohibited by the County unless no viable upland alternative exists (Section 18, Snohomish County Shoreline Management Program).
- Construction would occur in designated Island County shoreline areas. The Island County Shoreline Master Programs stipulates that roadway construction shall be located away from shoreline areas whenever feasible.
- Shorelines of Statewide Significance that would be affected include the marine shoreline of Skagit County, Island County and Snohomish County in the project vicinity. Shorelines of Statewide Significance are given higher priority for protection and preservation than other designated shoreline areas.
- The bridge would cross commercial and tribal crab and fish harvesting areas.

Ferry Alternative from Whidbey Island to North Stanwood Vicinity

A detailed summary of expected impacts and costs of this alternative is presented in *SUMMARY OF FEASIBILITY MEASURES, Ferry Alternative from Whidbey Island to North Stanwood Vicinity*, (Appendix C-4).

Planning Level Construction Cost Estimate: Single ferry operation with landing at Strawberry Point - $221.7 million. Two ferry operation with landing at Oak Harbor or Coupeville - $297.7 million. These estimates include roadways, bridge/dock, right of ways, traffic mitigation, ferry vessel, and ferry terminals. Project level rate of return for ferry operations was not evaluated, since ferry revenues are not expected to cover annual ferry operating costs, much less repay the construction or capital costs of the alternatives.

National Historic District: The proposed Coupeville ferry terminal might impact the Ebey's Landing National Historical Reserve, which includes Coupeville and portions of Penn Cove. This would raise Section 4F issues and permitting is not expected to be obtained for this ferry terminal location.

Significant impacts are expected with this alternative on Federally listed threatened and endangered species as follows:

- For all ferry route alternatives, two salmon-bearing streams would be potentially affected.
- Three bald eagle nests in three bald eagle territories are within 0.5 mile of the alignment.
- Two and one-half miles of estuarine habitat in Skagit Bay would potentially be affected by the bridge/dock alignment. These areas are recognized as important wintering and staging habitat for waterfowl, spawning/rearing habitat for threatened chinook salmon, proposed threatened bull trout, and as spawning/rearing habitat for herring, and smelt.

- Of the 2.5 mile of estuarine habitat crossed by the bridge/dock, approximately 0.3 mile are through eelgrass habitat; an important habitat critical for supporting several priority fish species and other marine life. Eelgrass beds are considered to be irreplaceable and avoidance is the recommended mitigation.

These impacts would present serious obstacles for obtaining approval by the US Fish and Wildlife Service and National Marine Fisheries Service.

- At least 60 emergent and forested wetland areas and open water habitat would potentially be affected by the alignment. Adequate mitigation may be achieved through avoidance and minimization measures.

These impacts would present serious obstacles for obtaining permits.

- The 2.5 mile dock in the Stanwood vicinity would be located in intertidal wetlands in Snohomish County shoreline jurisdiction. These wetlands are designated and Priority Habitat by WDFW. Snohomish County shoreline regulations state "The location, design, construction and operation of boating facilities [including piers and docks] should endeavor to minimize any adverse affects on priority habitats, fish and shellfish resources, and the adjacent areas."
- Shorelines of Statewide Significance that could be affected include the Skagit Bay marine shoreline of Island County and Snohomish County in the project vicinity. Shordines of Statewide Significance are given higher priority for protection and preservation than other designated shoreline areas.
- A ferry landing at Coupeville could adversely affect commercial and tribal shellfish harvest areas, depending on the location of the landing.
- Ferry traffic across Skagit Bay would cross fishing areas, potentially disrupt fishing activities, and could result in loss of fishing gear.

Concluding Steps for the SR 20 North Whidbey Island Access Feasibility Study

The Technical Committee at the November 1, 1999 meeting made a pending recommendation that all of the four alternatives evaluated are not feasible for implementation as vehicular capacity access to North Whidbey Island. This pending recommendation is based on rating of four of the five criteria for assessing feasibility of the alternatives. Attached is a summary of ratings, tabulated by McClure Consulting. More information on transportation performance was requested to complete the analysis and allow the committee, as a whole, to fully evaluate the criteria and measures of feasibility. It was agreed that each of the alternatives are not feasible due to the potential for environmental impacts to critical areas and to habitat. In addition, the ferry alternative was considered to be not feasible due to the costs to implement and operate.

On April , 2000, the Policy Committee approved the final recommendations for forwarding to the Policy Boards. On April 19, 2000, the Skagit Sub-Regional Transportation Planning Organization (SRTPO) approved the recommendations with the understanding that the issue would have to be revisited in the future as need increased, probably in five to eight years.

The Policy Board members also recognized that the design life of the Deception Pass Bridge was approaching. Although WSDOT engineers have extended the useful life of the bridge, it will eventually have to be replaced. When this occurs, the bridge could be closed for approximately one and one half years. A new structure could serve as access until the current structure was replaced.

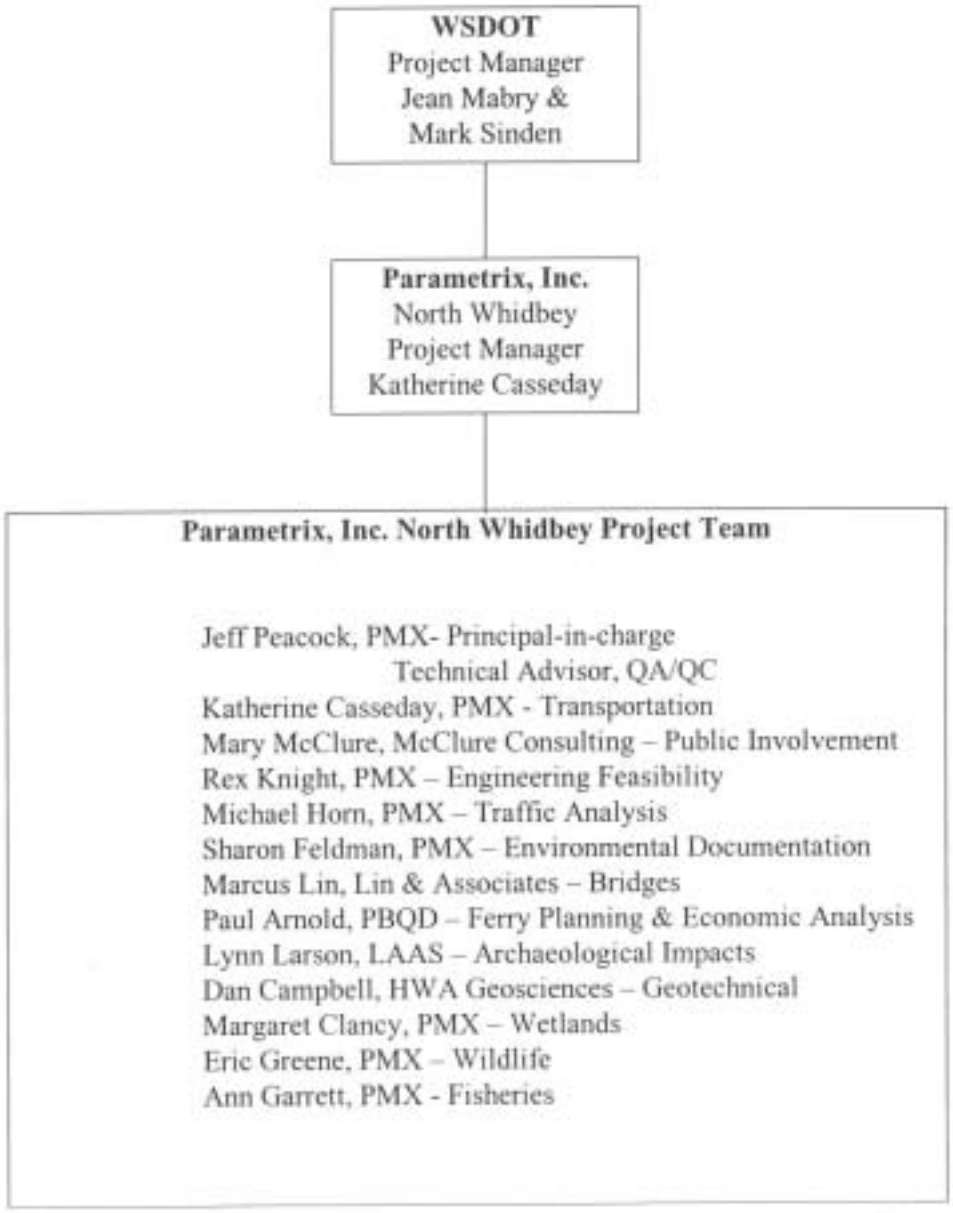
As an information item the Policy Board was advised that the determination of non-feasibility of all alternatives could open the door to revisiting an alternative at or near the current local. Section 4F prevents the taking of parklands for highway purposes, unless there are no feasible alternatives. Any such considerations would have to minimize impacts. A possibility is a tunnel under the park.

The Island County SRTPO Policy Board approved of the recommendations on April 26, 2000 and the full RTPO approved of them on June 14, 2000 with the same qualifiers and understandings.

SR 20 North Whidbey Island Access Feasibility Study

CONSULTANT PROJECT TEAM

ATTACHMENT TO PROJECT ORGANIZATION CHART



SR 20 North Whidbey Island Access Feasibility Study

Summary of Ratings:
Alternatives on Feasibility Criteria

November 1, 1999 Technical Committee Meeting

	North Bridge: La Conner		
Community Impacts	**All**	**TC**	**Exp**
Probably feasible	-	-	-
Serious impacts that could probably be mitigated	4	3	1
Probably not feasible	7	7	-
Land Use/Economic Development Impacts			
Probably feasible	-	-	-
Serious impacts that could probably be mitigated	5	4	1
Probably not feasible	6	5	1
Financial Performance			
Probably feasible	1	1	-
Serious impacts that could probably be mitigated	3	2	1
Probably not feasible	4	3	1
Environment: Critical Areas			
Probably feasible	-	-	-
Serious impacts that could probably be mitigated	2	1	1
Probably not feasible	10	7	3
Environment: Habitat			
Probably feasible	-	-	-
Serious impacts that could probably be mitigated	2	2	-
Probably not feasible	12	7	5

All = All Committee members who rated this item
TC = Rated item based on judgment as a member of the Technical Committee
Exp = Rated item based on professional expertise in this specific area

Summary of Ratings:
Alternatives on Feasibility Criteria

November 1, 1999 Technical Committee Meeting

	Middle Bridge					
	Fakkema Road			Crescent Road		
Community Impacts	**All**	**TC**	**Exp**	**All**	**TC**	**Exp**
Probably feasible	2	1	1	-	-	-
Serious impacts that could probably be mitigated	5	5	-	6	5	1
Probably not feasible	2	2	-	3	3	-
Land Use/Economic Development Impacts						
Probably feasible	1	-	1	2	1	1
Serious impacts that could probably be mitigated	4	4	-	4	4	-
Probably not feasible	6	5	1	5	4	1
Financial Performance						
Probably feasible	3	2	1	3	2	1
Serious impacts that could probably be mitigated	3	2	-	2	2	-
Probably not feasible	3	2	1	3	2	1
Environment: Critical Areas						
Probably feasible	-	-	-	1	1	-
Serious impacts that could probably be mitigated	3	2	1	3	2	1
Probably not feasible	8	5	3	8	5	3
Environment: Habitat						
Probably feasible	-	-	-	1	1	-
Serious impacts that could probably be mitigated	4	3	1	3	2	1
Probably not feasible	10	6	4	10	6	4

All = All Committee members who rated this item
TC = Rated item based on judgment as a member of the Technical Committee
Exp = Rated item based on professional expertise in this specific area

SR 20 North Whidbey Island Access Feasibility Study

Summary of Ratings:
Alternatives on Feasibility Criteria

November 1, 1999 Technical Committee Meeting

	South Bridge: Stanwood Vicinity		
Community Impacts	**All**	**TC**	**Exp**
Probably feasible	2	1	1
Serious impacts that could probably be mitigated	5	5	-
Probably not feasible	3	3	-
Land Use/Economic Development Impacts			
Probably feasible	1	1	-
Serious impacts that could probably be mitigated	5	4	1
Probably not feasible	5	4	1
Financial Performance			
Probably feasible	1	1	-
Serious impacts that could probably be mitigated	4	3	1
Probably not feasible	3	2	1
Environment: Critical Areas			
Probably feasible	-	-	-
Serious impacts that could probably be mitigated	4	3	1
Probably not feasible	8	5	3
Environment: Habitat			
Probably feasible	-	-	-
Serious impacts that could probably be mitigated	2	2	-
Probably not feasible	12	7	5

All = All Committee members who rated this item
TC = Rated item based on judgment as a member of the Technical Committee
Exp = Rated item based on professional expertise in this specific area

SR 20 North Whidbey Island Access Feasibility Study

Summary of Ratings:
Alternatives on Feasibility Criteria

November 1, 1999 Technical Committee Meeting

	Ferry Options								
	Strawberry Point			Oak Harbor			Coupeville		
Community Impacts	**All**	**TC**	**Exp**	**All**	**TC**	**Exp**	**All**	**TC**	**Exp**
Probably feasible	6	5	1	5	4	1	3	3	-
Serious impacts that could probably be mitigated	2	2	-	3	3	-	3	2	1
Probably not feasible	1	1	-	1	1	-	3	3	-
Land Use/Economic Development Impacts									
Probably feasible	3	2	1	3	2	1	3	2	1
Serious impacts that could probably be mitigated	6	6	-	5	5	-	4	4	-
Probably not feasible	2	1	1	2	1	1	3	2	1
Financial Performance									
Probably feasible	-	-	-	-	-	-	-	-	-
Serious impacts that could probably be mitigated	2	2	-	1	1	-	-	-	-
Probably not feasible	6	4	2	7	5	2	8	6	2
Environment: Critical Areas									
Probably feasible	-	-	-	-	-	-	-	-	-
Serious impacts that could probably be mitigated	4	3	1	5	4	1	5	4	1
Probably not feasible	8	5	3	7	4	3	7	4	3
Environment: Habitat									
Probably feasible	-	-	-	-	-	-	-	-	-
Serious impacts that could probably be mitigated	1	1	-	1	1	-	1	1	-
Probably not feasible	12	7	5	12	7	5	12	7	5

All = All Committee members who rated this item
TC = Rated item based on judgment as a member of the Technical Committee
Exp = Rated item based on professional expertise in this specific area

APPENDIX A
Technical and Policy Committee Rosters
Scoping Meeting Notes

SR 20 North Whidbey Island Access Feasibility Study
Policy Steering Committee

Bob Josephson
Mt. Baker Area Administrator, WSDOT

Ray Deardorf
Planning Director, WSF

Brian Cladoosby
Swinomish Indian Senate Chairman

Steve Dernback/ Patty Cohen
Mayor, City of Oak Harbor

William L. "Mac" McDowell
County Commissioner, Island County Dist. #2

Bud Moore
Mayor, La Conner

O. Harvey Wolden
County Commissioner, Skagit County Dist. #2

Matthew McCune
Mayor, Stanwood

Rick Larsen
County Council, Snohomish County Dist. #1

SR 20 North Whidbey Island Access Feasibility Study
Technical Steering Committee

Jerry Schutz
Transportation Planning Manager, WSDOT Mt. Baker Area

Celine Gihring
Planning Services Manager, WSF

Mike Morton
Transportation Planner, Island County

Lew Legat
Assistant Island County Engineer

Vince Moore
Planning & Community Development Director, Island County

Tom Burdett
Planning Director, Oak Harbor

Ryan Goodman
Engineer, Oak Harbor

Larry Cort
Town Planner, Coupeville

Jack Lynch
Planner, Langley

Martha Rose
Executive Director, Island Transit

Eric Irelan
Transportation Program Manager, Skagit Council of Governments

Dave Baltz
Transportation Planner, Skagit County

Kirk Johnson
Associate Planner, Skagit County

Ed Good*
Town Planner, La Conner

Jim Lair
Executive Director, Skagit Transit

Kevin Murphy*
Senior Planner, PSRC

Mark Simonson
Senior Transportation Planner, Snohomish County

Bill Beckman
Public Works Director, Stanwood

Stephanie Cleveland
Community Development Director, Stanwood

Tobi Maggi*
Capital Facilities Planner, Community Transit

Allen Rozema*
Natural Resources Planner, Swinomish Tribal Community

Bill Overby
Head Park Ranger, Deception Pass State Park

Richard Johnson*
Habitat Biologist, Department of Fish and Wildlife

Loreé Randall*
SEA Program, Department of Ecology

Rich Melaas
Community Planning Liaison, Naval Air Station Whidbey

Jack Kennedy
Regulatory Project Manager, Army Corps of Engineers

Elaine Somers*
Environmental Review NEPA, EPA

Steve Roy*
Wetlands Specialist, EPA

Austin Pratt*
Office of Aids to Navigation, US Coast Guard

Melissa Flores*
Sounder Commuter Rail Project Assistant, Sound Transit

Hongzhi Zhang*
Bridge Engineer, WSDOT

Tom Simpson*
Access Management Engineer, WSDOT

Mike Swires*
Asst. Traffic Engineer, WSDOT Mt. Baker Area

Don Tonnes
National Marine Fisheries Service

Gary Davis *
Biology Program Manager, WSDOT NW Region

Dan Hagglund*
Environmental Coordinator, WSDOT NW Region

Louise Payne * or
Real Estate Appraisal Manager., WSDOT NW Region

Doug Winge* or
Real Estate Appraiser, WSDOT NW Region

Nancy Barsion*
Real Estate Appraiser, WSDOT NW Region

***Associate Member**

Jean Mabry
Community Planning Manager, WSDOT Mt Baker Region

Mark Sinden
Community Planner, WSDOT Mt Baker Region

Katherine Casseday
Project Manager, Parametrix

Mary McClure
Agency Liaison & Public Outreach, Mc Clure Consulting

Pam Kellner
Public Outreach Coordinator, McClure Consulting

ISLAND SUB-RTPO TECHNICAL COMMITTEE MEETING
&
WSDOT SR 20 North Whidbey Island Access Feasibility Study

Agency Scoping Meeting

Objective: *Obtain input to guide development of the feasibility study.*

Wednesday, September 9, 1998
1 p.m. - 3:30 p.m.
Main Street Market Room
Coupeville, WA

Attendees:

Mike Morton, Skagit/Island RTPO
Jean Mabry, WSDOT
Jerry Schutz, WSDOT
Russ Douglas, Mukilteo
Dale O'Brien, Skagit Transit
Rich Melaas, Naval Air Station Whidbey
Larry Harmon, Coupeville
Larry Cort, Coupeville
Lew Legat, Island County
Jack Lynch, Langley
Ryan Goodman, Oak Harbor
Eric Irelan, Skagit Council of Governments
Kirk Johnson, Skagit County
Dave Baltz, Skagit County
Sarah Swanson, League of Women Voters
Tom Burdett, Oak Harbor
Martha Rose, Island Transit
Katherine Casseday, Parametrix (scribe for notes)
Mary McClure, McClure Consulting
Brad Rucker, McClure Consulting

Meeting Notes for the SR 20 North Whidbey Island Access Feasibility Study

The Agency Scoping Meeting for the North Whidbey Island Access Feasibility Study was part of the September meeting for the Island Sub-RTPO Technical Committee. The notes below address only the North Whidbey Agency Scoping Meeting portion of the meeting.

SR 20 North Whidbey Island Access Feasibility Study Project Overview

After introductions, study project manager Jean Mabry outlined the purpose of the North Whidbey Island Access Feasibility Study as the identification of feasible alternatives for increasing the capacity for vehicular access to and from North Whidbey Island by either bridge or ferry connections. The study will be an elimination process, not a selection of a preferred alternative. The meeting purpose was to hear the attendee's voices and perspective for the study. The WSDOT staff team is supported by a consultant team led by Katherine Casseday of Parametrix.

Goals and Objectives

The goals and objectives for the study were introduced by Mary McClure, of McClure Consulting who will lead the public involvement element of the study. A draft goals and objectives list was included in the meeting packet for review. A discussion followed about the draft goals and objectives, with suggestions to revise the wording to clarify that the study

primary goal is to identify alternatives to *increase vehicular capacity*. This revision and other requested changes are in the attached revised Draft Goals and Objectives list. These goals and objectives will be presented for review at the Open House meetings in October. They will then be revisited at the next Technical Committee meeting prior to presenting them for adoption at the Policy Committee meeting in November.

There was discussion about passenger-only ferry service as an alternative, however, the feasibility study will not address that by itself, only as a part of vehicle ferry service. Passenger-only ferry service will be addressed in the Island County Least Cost Planning (LCP) effort. Jerry Schutz outlined the relationship between the Island County Least Cost Planning effort and the Update to the Regional Transportation Plan for Island County and the feasibility study. The key objective of the feasibility study is to determine if there is a project worth spending between $5 and 10 million on an environmental impact statement. Everything that doesn't fit into the capacity constrained expansion fits into the RTP update. Alternatives to any vehicular capacity expansion fit into the LCP study. The feasibility study started out with a broad-brush regional planning process which identified the need for capacity improvements. The next step in the feasibility study is to narrow down the many alternatives to those which are feasible for construction. The environmental and design process would then go forward in the next stage to select a preferred alternative for capacity improvements considering a full range of alternatives including passenger only ferries, TDM, etc.

It was agreed that it is important that the Least Cost Planning effort be coordinated with the feasibility study. The schedule for the LCP is to be completed by March 1999. The two studies complement each other in effort with the focus on the term *complementary*. The LCP conclusions and recommendations will be brought forward ahead of the feasibility study completion.

There was discussion about what is involved in evaluating the feasibility of an alternative: political, physical, social, environmental, geometric, and cost are all criteria for evaluation. It will be important to reflect economic impacts associated with the construction of additional access to Whidbey Island to help identify the political feasibility of an alternative (the two are interrelated).

It was requested that Camano Island be included in the possible locations for bridge and ferry alternatives. It was also noted that traffic impacts to Skagit County facilities will need to be identified as part of the feasibility analysis and that economic impacts to expanding or not expanding the access to Whidbey Island should be reviewed. Jerry noted that a detailed evaluation of economic impacts would be a part of the next step in the process which is the environmental review of feasible alternatives for selection of a preferred alternative to take into design. This evaluation would include freight impacts, job growth opportunities, etc. An economic evaluation is not a part of the scope for the feasibility analysis unless feedback from the public on the MOEs indicates that it is a critical issue.

It was clarified that this feasibility study will address alternatives for increased vehicular capacity to Whidbey Island, and a passenger-only ferry is not an alternative, however, passenger travel

would be assumed to be accommodated with a car ferry alternative. A foot-passenger only ferry would not address two key issues: freight movement needs and emergency access needs to the Island. It was noted that the Regional Transportation Plan is the tool to identify if passenger-only ferry service would be an alternative to be evaluated (as part of another study, not the access feasibility study) as part of the Least Cost Planning study.

Scope of Work and Schedule

A brief overview of the scope and schedule was presented which identified when the technical and policy committee meetings are planned, along with the open house meetings (coincident with the Least Cost Planning workshops). Up to three bridge alternatives and up to three ferry alternatives for additional access will be looked at, with a total of four alternatives to be evaluated in the feasibility study.

Traffic counts will be provided by WSDOT personnel, although there may be some locations where other agencies may be requested to provide traffic count information. Eric noted that if counts are needed, please give adequate notice to arrange for them. Questions included: What assumptions are made for the forecasts? Is Island County forecasted growth consistent with what was assumed for the Ferry System Plan?

There may be some difference between growth assumptions. The Island County transportation model was developed by Wm. Popp and Associates, using the TModel software, and is consistent with the Skagit County model. Eric Irelan will be working to update the Skagit County model for three concurrent transportation studies in the area: SR 20 North Whidbey Island Access Feasibility Study, the I-5 Corridor study through Mount Vernon and Burlington, and the SR 20 Corridor study. This will be advantageous for all three studies.

Committee Membership and Roles

Technical Committee

It was agreed that there is the right mix of proposed membership for the Technical Committee. Changes requested for the Technical Committee include adding Jack Lynch from Langley and substituting Kurt Johnson for Gary Christenson for the Skagit County Planning Department.

Policy Committee

Changes requested for the Policy Committee include adding one more representative from both the Island and Skagit Sub-Regional Transportation Policy Boards. The second representative from Skagit County Sub-Regional Transportation Policy Board would be included if really committed to being an active participant. It was noted that having three representatives from Island County as a whole would be sufficient, and there would not be a need for separate representatives from the Cities of Oak Harbor and Coupeville. Attached is the revised makeup for both the Policy and Technical Committees.

Baseline Assumptions

There was an initial discussion about baseline assumptions, and the group will revisit this list and work to tailor them to the feasibility study at the next Technical Committee meeting. There was a discussion concerning how to deal with tourist traffic, and Jerry noted that there is an upcoming

workshop for elected officials and staff to address the topic. The feasibility study will deal with commuter traffic needs and will not include modeling tourist traffic.

Study Alternatives
The draft list of alternatives was revised to clarify the range of alternatives to be evaluated for feasibility. An updated list of alternatives is attached.

Resident Survey
The value of conducting the resident survey in addition to the data already available from the April, 1998 survey was questioned. It was the recommendation from the group that the effort be spent in a review of the April sample, with focus on the answers to the "other" options on the survey forms. Mike noted that all of these items identified for the telephone resident survey were covered with the April survey except the identification of the decision point for choosing ferry or bridge for off-island travel. Along with this review of the April survey responses, it was suggested to review the WSF origin and destination survey conducted for the Mukilteo terminal study and EIS. Mike Morton will provide the survey data files and physical forms for McClure staff to review and summarize for both the feasibility study and to support the LCP effort. Mary will contact Ray Deardorf of WSF for more information about the WSF O-D survey at Mukilteo.

Next Steps in Study Process
Three open house meetings for the feasibility study will be held coincident with the October workshops for the Least Cost Planning project, October 20-22. The North Whidbey open houses will run from 4-7 PM and the LCP workshops will run from 5-6:30PM, providing time for overlap at both ends of the workshop.

Next SR 20 N Whidbey Island Study Technical Committee Meeting
The next meeting was proposed for the week of November 9, 1998, to meet separately from the planned Island Sub-RTPO Technical Committee meeting. The first Policy Committee meeting for the feasibility study would be in the week of November 16th. Dates will be confirmed.

It was suggested that there be a formal introduction of the project to both the Island and Skagit Sub-RTPO Policy Boards. Bob Josephson of WSDOT is on both Policy Boards and may be the key person for the project introduction.

Mary requested input from the attendees for suggestions for Key Person interviews. Please call her at (360) 297-4300.

The meeting reverted to the RTPO meeting agenda.

APPENDIX B
Technical Memoranda

North Whidbey Island Access Feasibility Study Cultural Resources Overview

Larson Anthropological Archaeological Services Limited (LAAS) was retained by Parametrix, Incorporated, to conduct a cultural resources overview for the proposed State Route 20 North Whidbey Island Access Feasibility Study in Island, Skagit, and Snohomish Counties, Washington. The Washington State Department of Transportation identified a vehicle capacity deficiency on the SR 20 corridor and the Deception/Canoe Pass bridges linking Fidalgo Island, Skagit County, and north Whidbey Island, Island County. Four project alternative alignments were considered in this overview. The overview consisted of archival review, tribal consultation, consultation with local historical societies and county agencies, a review of records on file at the Washington State Office of Archaeology and Historic Preservation (OAHP), and production of a cultural resources technical report. Recorded archaeological sites and inventoried historic structures, on file at the OAHP and historic structures and sites important for local historical societies and planning agencies within 0.5 mile of the proposed alternative alignments were included in the overview. No field reconnaissance was conducted for this assessment.

The La Conner Vicinity Bridge Alternative alignment is in high probability areas for unknown hunter-fisher-gatherer archaeological resources and has a moderate probability for historic period archaeological resources. Forty-two hunter-fisher-gatherer and historic period archaeological sites are recorded within 0.5 mile of the La Conner Vicinity Bridge Alternative alignment. Thirty-five of the 42 recorded archaeological sites would require evaluation for significance, i.e. eligibility for listing in the National Register of Historic Places (NRHP). Researchers extended eligibility recommendations for five sites but concurrence was not sought from Washington State OAHP. Two hunter-fisher-gatherer shell midden sites are eligible for listing in the NRHP. Six inventoried buildings and building complexes would require evaluation for listing in the NRHP. No traditional cultural properties were reported in the La Conner Vicinity Bridge Alternative alignment project area.

The probability for unknown hunter-fisher-gatherer archaeological sites within 0.5 mile of the Fir Island Bridge Alternative alignment is low in the upland areas of Whidbey Island, moderate near the littoral margins of Skagit Bay on Whidbey Island, and high on the mainland in the Skagit River delta. Probability for unknown, intact historic period archaeological sites along the Whidbey North Alignment and Whidbey South Alignment is low, particularly along the Crescent Harbor Road portion of the Whidbey South Alignment, due to the development of Oak Harbor. Fifteen hunter-fisher-gatherer and historic period archaeological sites were identified within 0.5 mile of the Fir Island Bridge Alternative alignment, and fourteen would require evaluation for significance and/or eligibility for listing in the NRHP. One historic period archaeological site is eligible for listing in the NRHP according to the researcher, but concurrence is required from the Washington State OAHP. Two inventoried buildings and building complexes require evaluation. One building complex is noted as probably eligible and concurrence

would be sought with the Washington State OAHP. No traditional cultural properties were in the Fir Island Bridge Alternative project area.

The probability for unknown hunter-fisher-gatherer archaeological sites within 0.5 mile of the Stanwood Vicinity Bridge Alternative alignment is high at the nearshore areas of the convergence of the South Fork of the Skagit River and the Stillaguamish River and at the base of upland areas. The Stanwood Vicinity Bridge Alternative alignment on Whidbey Island has a low probability for extant hunter-fisher-gatherer archaeological sites. The probability is low for intact historic period archaeological resources in the upland areas north of Oak Harbor and Crescent Harbor along Crescent Harbor Road, largely from disturbance caused by development of Oak Harbor and the Naval Air Station-Whidbey Island (NASWI). The probability is moderate for unknown intact historic period archaeological resources on the mainland along 300th Street Northwest. Three hunter-fisher-gatherer archaeological sites were identified within 0.5 mile of the Stanwood Vicinity Bridge Alternative alignment. The sites would require evaluation for significance, i.e. eligibility for listing in the NRHP. No traditional cultural properties were identified in the Stanwood Vicinity Bridge project area.

The probability for unknown hunter-fisher-gatherer archaeological sites within 0.5 mile of the Whidbey Island Ferry Alternative alignment on the mainland is high at the nearshore areas of the convergence of the South Fork of the Skagit River and the Stillaguamish River and at the base of upland areas. The probability is moderate for unknown historic period archaeological resources on the mainland along 300th Street Northwest. Proposed ferry landing sites in the Strawberry Point, Oak Harbor, and Coupeville vicinities have high probabilities for unknown hunter-fisher-gatherer archaeological resources. Two hunter-fisher-gatherer archaeological sites were identified within 0.5 mile of the Whidbey Island Ferry Alternative alignment on the mainland. One hunter-fisher-gatherer archaeological site in the vicinity of Strawberry Point has not been evaluated for listing in the NRHP. Four of eight hunter-fisher-gatherer archaeological sites and three historic structures within 0.5 mile of the littoral margins of Oak Harbor have not been evaluated for listing in the NRHP. Four other hunter-fisher-gatherer archaeological sites have recommendations regarding eligibility but would require the concurrence of Washington State OAHP. Construction of ferry terminals would probably not directly affect unidentified underwater cultural resources, such as U.S. Navy aircraft and submerged vessels, and archaeological sites more than 0.5 mile away from ferry landing areas. Wave action along shoreline areas caused by ferry service between the mainland to Strawberry Point, or through Saratoga Passage to Oak Harbor or Coupeville, may adversely affect archaeological sites along Utsalady Point, Polnell Point, Maylor Point, and the north, west, and south margins of Penn Cove. No traditional cultural properties were in the Whidbey Island Ferry Alternative project area.

North Whidbey Island Access Feasibility Study
Social Impacts Analysis

Introduction

The Washington State Department of Transportation (WSDOT) identified a vehicle capacity deficiency on the SR 20 corridor and Deception Pass/Canoe Pass bridges linking Fidalgo Island, Skagit County and north Whidbey Island, Island County. The North Whidbey Island Access Feasibility Study is being conducted to evaluate four proposed routes across Skagit Bay that would link SR 20 on north Whidbey Island to Interstate 5. To evaluate the alternatives, various Measures of Feasibility (MOF) were developed in cooperation with the project Policy and Technical Steering Committees that take into consideration social impacts, land use/economic development impacts, financial/economic performance, environmental impacts, and transportation performance.

Three MOF were developed to evaluate social impacts: S1-impacts to cultural resources; S2-impacts to residences; and S3-traffic impacts on local neighborhoods. This technical memorandum provides an analysis of the social impacts associated with the proposed alternatives using these MOF. The findings presented in this technical memorandum will be used by the Policy and Technical Steering Committees to evaluate the feasibility of the proposed alternatives.

Methods

Potential impacts on cultural resources were assessed by conducting an inventory of the type and significance of historic and archaeological sites within ½ mile of each proposed alternative alignment. The inventory was conducted by Larson Anthropological Services Limited and summarized in a cultural resources technical report (Larson, 1999). Information was obtained from archival review, tribal consultation, consultation with local historical societies and county agencies, and a review of records on file at the Washington State Office of Archaeology and Historic Preservation (OAHP).

Potential impacts on residences were assessed by estimating the number of residences within ½ mile of each proposed alternative alignment. An initial count of residences was made using 1-inch:1000-feet black and white aerial photographs dated May 5, 1999. A site reconnaissance was conducted on September 14, 1999 to verify the photograph counts.

Potential traffic impacts on existing neighborhoods were assessed by determining likely changes in roadway classification, non-arterial to arterial conversions, changes in speed limits, and changes in side street or property access that could result from the proposed alternatives.

Findings

S1 Cultural Resources Affected

The SR 20 North Whidbey Island Access Feasibility Study project area overlays an area formerly occupied by a cluster of independent aboriginal communities. The descendants of these aboriginal groups are primarily members of the Swinomish Tribe. The proposed project area is also within or adjacent to the usual and accustomed fishing areas of the Upper Skagit Tribe, Tulalip Tribes, and Stillaguamish Tribe. Euroamerican settlement of the area began in earnest around the 1860s.

This MOF assesses potential impacts to cultural resources within ½ mile of the proposed alternatives. Based on the cultural resources overview (Larson, 1999), cultural resources in the area are generally categorized as hunter-fisher-gather archaeological sites, historic archaeological sites, traditional cultural properties, and historic structures.

Hunter-fisher-gather sites provide evidence of aboriginal fishing, shellfish harvesting, hunting, gathering, and processing activities. These include shell midden sites; which are refuse deposits that often contain shell fragments, fire modified rock, charcoal fragments, lithic and bone artifacts, burials, faunal remains, and perishable fiber baskets. In addition to documented sites, the probability (high, medium. low) of unknown sites was assessed for each alternative.

Historic archaeological sites are archaeological deposits that relate to non-native land use and occupation and that are more than 50 years old. Archaeological sites identified include sites listed in the National Register of Historic Places (NRHP) as well as sites that could be eligible for listing. In addition to documented sites, the probability (high, medium. low) of unknown sites was assessed for each alternative.

Traditional cultural properties, as defined by National Register Bulletin 38 (Parker and King 1992) are properties that are eligible for inclusion in the National Register because of their association with cultural practices or beliefs of a living community that (a) are rooted in that community's history, and (b) are important in maintaining the continuing cultural identity of the community. Traditional cultural properties may include hunting, fishing, and gathering areas or meeting places. No such sites were reported to occur within ½ mile of the proposed alternatives.

Historic structures identified within ½ mile of the alternatives include sites listed in the NRHP as well as sites that could be eligible for listing.

The historic buildings, archaeological sites, earthworks, and non-native vegetation in the Skagit River Delta, when taken as a whole, may comprise a historic cultural landscape. Historic cultural landscapes are areas with a diverse range of evidence that demonstrate human adaptation to, and modification of, natural landforms. Cultural features

commonly associated with historic cultural landscapes include plantings of non-native vegetation, road and path networks, property ownership markers such as rock alignments or linear plantings to form hedges or tree lines, drainage ditch and dike networks, and complexes of standing structures. Ebey's Landing National Historical Reserve on Whidbey Island, listed in the NRHP as the Central Whidbey Island Historic District, is a historic cultural landscape.

Bridge from North Whidbey Island to La Conner Vicinity

This alternative alignment is in high probability areas for unknown hunter-fisher-gatherer archaeological resources and has a moderate probability for historic period archaeological resources.

Forty-two hunter-fisher-gatherer and historic period archaeological sites are recorded within 0.5 mile of the alignment. Most sites in the alternative alignment vicinity are surface exposures of shell midden deposits eroding on the ground surface at littoral areas of Dugualla Bay on Whidbey Island, along the North and South Forks of the Skagit River, and along sloughs of Fir Island. Three historic period archaeological sites are historic town or village complexes containing buildings and structures, including Conway, Mann's Landing/Fir (early Conway vicinity), and Fishtown. A cemetery, a granary, and two historic period refuse areas also received Smithsonian numbers from the Washington State OAHP. Thirty-five of the 42 recorded archaeological sites would require evaluation for significance, i.e. eligibility for listing in the NRHP. Two hunter-fisher-gatherer shell midden sites are eligible for listing in the NRHP.

Six inventoried buildings and building complexes would require evaluation for listing in the NRHP. No traditional cultural properties were reported in the project area of this alternative.

Locations of recorded archaeological sites and inventoried historic structures within ½ mile of the alignment are shown on Figure 2 of the Cultural Resources Report (Larson, 1999) (attached).

Bridge from Strawberry Point on North Whidbey Island to Conway Vicinity via Fir Island

The probability for unknown hunter-fisher-gatherer archaeological sites within 0.5 mile of the alignment is low in the upland areas of Whidbey Island, moderate near the littoral margins of Skagit Bay on Whidbey Island, and high on the mainland in the Skagit River delta. Probability for unknown, intact historic period archaeological sites along the Whidbey North Alignment and Whidbey South Alignment is low, particularly along the Crescent Harbor Road portion of the Whidbey South Alignment, due to the development of Oak Harbor.

Fifteen hunter-fisher-gatherer and historic period archaeological sites were identified within 0.5 mile of the Fir Island Bridge Alternative alignment, and fourteen would require evaluation for significance and/or eligibility for listing in the NRHP. Most sites

in the alignment vicinity were surface exposures of shell midden deposits along sloughs of Fir Island and on or near the South Fork of the Skagit River. Two sites are historic town or village complexes containing buildings and structures, including Conway and Mann's Landing/Fir (early Conway vicinity). Weaver's Cemetery also received a Washington State OAHP number. No recorded archaeological sites are within 0.5 mile of the two Whidbey Island segments of this alternative.

Two inventoried buildings and building complexes require evaluation. One building complex is noted as probably eligible and concurrence would be sought with the Washington State OAHP. No traditional cultural properties were in the project area of this alternative.

Locations of recorded archaeological sites and inventoried historic structures within ½ mile of the alignments are shown on Figure 3 of the Cultural Resources Report (Larson, 1999) (attached).

Bridge from Strawberry Point on North Whidbey Island to North Stanwood Vicinity
The probability for unknown hunter-fisher-gatherer archaeological sites within 0.5 mile of the alignment is high at the nearshore areas of the convergence of the South Fork of the Skagit River and the Stillaguamish River and at the base of upland areas. The portion of the alignment on Whidbey Island has a low probability for extant hunter-fisher-gatherer archaeological sites. The probability is low for intact historic period archaeological resources in the upland areas north of Oak Harbor and Crescent Harbor along Crescent Harbor Road, largely from disturbance caused by development of Oak Harbor and the Naval Air Station-Whidbey Island (NASWI). The probability is moderate for unknown intact historic period archaeological resources on the mainland along 300th Street Northwest.

Three hunter-fisher-gatherer shell midden sites were identified within 0.5 mile of the alignment. The sites would require evaluation for significance, i.e. eligibility for listing in the NRHP. No historic archaeological sites were identified.

No historic structures were identified within 0.5 mile of this alternative.

No traditional cultural properties were identified in the Stanwood vicinity bridge project area.

Locations of recorded archaeological sites within ½ mile of the alignment are shown on Figure 4 of the Cultural Resources Report (Larson, 1999) (attached).

Ferry from Whidbey Island to North Stanwood Vicinity
Proposed ferry landing sites in the Strawberry Point, Oak Harbor, and Coupeville vicinities have high probabilities for unknown hunter-fisher-gatherer archaeological resources.

One hunter-fisher-gatherer archaeological site in the vicinity of Strawberry Point has not been evaluated for listing in the NRHP.

Four of eight hunter-fisher-gatherer archaeological sites and three historic structures within 0.5 mile of the littoral margins of Oak Harbor have not been evaluated for listing in the NRHP. Ferry alternative landings at Coupeville and Oak Harbor may be within 0.5 mile of recorded archaeological sites depending on the locations of the ferry landings. At least 30 recorded archaeological sites, primarily hunter-fisher-gatherer shell midden sites, are along the littoral margins of Penn Cove.

Construction of ferry terminals would probably not directly affect unidentified underwater cultural resources, such as U.S. Navy aircraft and submerged vessels, and archaeological sites more than 0.5 mile away from ferry landing areas. Wave action along shoreline areas caused by ferry service between the mainland to Strawberry Point, or through Saratoga Passage to Oak Harbor or Coupeville, may adversely affect archaeological sites along Utsalady Point, Polnell Point, Maylor Point, and the north, west, and south margins of Penn Cove.

No inventoried historic structures are within 0.5 mile of the Strawberry Point Landing alternative. Two historic structure may be within 0.5 mile of the Oak Harbor Landing alternative, depending on the final location for the landing. The structures have not been evaluated for listing in the NRHP.

The Central Whidbey Island Historic District covers approximately 17,000 acres on Whidbey Island, including Coupeville and the margins of Penn Cove. It is managed by the National Park Service as Ebey's Landing National Historical Reserve. Additional buildings and information was added to the NRHP listing nomination in 1998. The Coupeville Landing alternative would probably be within 0.5 mile of buildings or structures included as part of the nomination, including the Coupeville dock in downtown Coupeville, depending on the location of the landing

No traditional cultural properties were within ½ mile of the proposed ferry landing sites.

Locations of recorded archaeological sites and inventoried historic structures within ½ mile of the proposed ferry landing sites are shown on Figure 5 of the Cultural Resources Report (Larson, 1999) (attached).

Mitigation

For each of the proposed alternatives, additional archaeological investigation, including field reconnaissance, would be required to identify previously recorded and unknown hunter-fisher-gatherer and historic period archaeological resources, and evaluation, to determine the significance of identified archaeological resources. Evaluation of identified archaeological sites may include conducting test excavations to determine the integrity and significance of archaeological deposits. If test excavations demonstrate that a site has integrity and can provide material data that can be used to answer research questions

regarding the prehistory or history of the area, the site may be significant and, therefore, may be eligible for listing in the NRHP.

For each of the proposed alternatives, additional historic structure inventories and evaluations would be required to determine significance of identified historic structures. Evaluation of an identified historic structure may include archival review and local informant interview to determine the integrity and significance of the structure.

Archaeological sites and historic structures determined to be significant, and therefore eligible for listing in the NRHP, which would be affected by proposed alignment construction activities should be avoided. If avoidance of the site would not be possible, mitigation, e.g. data recovery of archaeological sites or HABS/HAER documentation of a historic structure, would be necessary. The evaluation process requires consultation with the Washington State Office of Archaeology and Historic Preservation, the lead federal agency, and the affected Indian Tribes.

Unknown traditional cultural properties within 0.5 mile of the project area alignments would also require identification and evaluation for significance. The inventory and evaluation of rural historic landscapes conforms to criteria for evaluating cultural resource significance for listing in the NRHP that are outlined in 36 CFR 800.10 and would be conducted in consultation with the Washington State OAHP, the lead federal agency, and the affected Indian Tribes (McClelland 1990).

S2 Residences Affected

This MOF assesses the number of residences within ½ mile of the proposed alternatives. Residents within ½ mile of a new highway could be adversely affected by increased noise and local traffic, restricted access, and induced development, as well as direct displacement. Residences and businesses were noted within the proposed right of way for the alternative and are listed in total for the alternative.

Bridge from North Whidbey Island to La Conner Vicinity
A total of 367 residences occur within ½ mile of this alternative alignment. Of these, 185 are located on Whidbey Island. Most this area is rural residential, with residences occurring on farms or large lots. High-density residential areas occur as scattered clusters of subdivision-type development, predominantly located near SR 20 and the shoreline. The 182 residences within ½ mile of the Skagit County portion of the alternative are predominantly farmsteads or rural residences along the South and North Forks of the Skagit River. High-density development occurs in the Conway vicinity. An estimated total of 52 residences and 7 businesses lie along the right of way for the alternative.

Bridge from Strawberry Point on North Whidbey Island to Conway Vicinity via Fir Island
A total of 767 residences occur within ½ mile of this alternative for the Fakkema Road option, and 1,246 occur within ½ mile of the Crescent Road option. On Whidbey Island,

656 occur along the Fakkema Road option, and 1,133 occur along the Crescent Road option. The substantially higher number for the Crescent Road option is attributed to high-density housing in the Oak Harbor vicinity, on Whidbey Island Naval Air Station, and along the shoreline.

The 113 residences within ½ mile of the Skagit County portion of the alternative are predominantly farmsteads. High-density development occurs in the Conway vicinity. An estimated total of 63 residences and 6 businesses lie along the right of way for the Fakkema Road alignment and an estimated total of 96 residences and 9 businesses lie along the right of way for the Crescent Harbor Road alignment.

Bridge from Strawberry Point on North Whidbey Island to North Stanwood Vicinity
Approximately 1,391 residences occur within ½ mile of this alternative alignment. The relatively high number of residences is attributed to high-density housing along Crescent Road in the vicinity of Oak Harbor, on Whidbey Island Naval Air Station, and along the Whidbey Island shoreline. Of the total residencies within ½ mile of the alternative, 1,180 are on Whidbey Island, and 211 are in Snohomish County. Within Snohomish County, most of the residences are on farmsteads or rural residential lots. An estimated 87 residences and 4 businesses lie within the proposed right of way for the alternative.

Ferry from North Stanwood Vicinity to North Whidbey Island
Approximately 4 rural residences lie within ½ mile of this alternative alignment in Snohomish County. Each of these residences would be affected by the right of way acquisition.

Mitigation
FHWA guidelines require noise impacts on sensitive receptors, such as residences, that exceed threshold levels be mitigated. Noise impacts associated with the proposed alternatives would likely not require mitigation.

For properties where displacements are unavoidable, owners would be compensated at fair market value in accordance with the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended.

S3 Potential Traffic Impacts to Neighborhoods

This MOF assesses the changes in neighborhood connection and overall travel which could be results of either new bridge or ferry connection to North Whidbey Island. Improvements would be made to existing roadways along the bridge alternative connecting roadways to provide a two-lane major arterial roadway with rural highway characteristics, including 50 mph posted speed limit. A change in roadway classification and posted speed limit could result in changes in how traffic uses the roadway as well as how adjacent properties access the roadway, the spacing of driveways and the possible consolidation of cross-street connections. Neighborhood travel could change with some out of the way travel. Bicycle and pedestrian travel across the roadway should be

consolidated to key intersections where safe crossings can be incorporated into the design of the facility. Broader shoulders would be an improvement for much of the existing roadways along the routes.

Bridge from North Whidbey Island to La Conner Vicinity
The classification of Frostad Road would be upgraded from collector arterial to minor arterial and the speed limit would change from 35 mph to 50 mph. The classification of Dodge Valley Road would change from local road to minor the arterial and the speed limit would change from 25 mph to 50 mph. The classification of Fir Island Road would remain the same and the speed limit would increase from 40 mph to 50 mph. All intersecting streets would stop at the new roadway facility, with some possible change in level of control along the corridor. Signalized intersections may be needed at SR 20 and at the intersections of Best/Chilberg Road and the new facility, near the town of Conway for access and a reconfiguration of the interchange at I-5 could be needed. Local traffic may need to be consolidated at key cross streets and this could result in some out-of-direction travel for neighborhood traffic.

Bridge from Strawberry Point on North Whidbey Island to Conway Vicinity via Fir Island
The classification of Fakkema Road would remain the same, with an increase in posted speed limit from 40 mph to 50 mph. The classification of Silver Lake Road would change from collector arterial to minor arterial with an increase in posted speed limit from 35 mph to 50 mph. As for the bridge alternative from north Whidbey Island to the La Conner vicinity, the classification of Fir Island Road would remain the same, with an increase in posted speed limit from 40 mph to 50 mph.

Another alignment option considered for this bridge alternative would connect SR 20 to Silver Lake Road via Crescent Harbor Road. For this alignment option, the classification of Crescent Harbor Road would remain the same along the western portion, and would be upgraded from collector to minor arterial along the eastern section. The speed limit along Crescent Harbor Road would increase from 40 and 35 mph to 50 mph connecting to Silver Lake Road and east to the bridge.

All intersecting streets would stop at the new roadway facility, with some possible change in level of control along the corridor. Key side streets where there could be a change in traffic control are Taylor Road, Devries Road and Strawberry Point Road. Signalized intersections may be needed at SR 20 and at the intersections of Taylor Road, at the Fir Island Road north leg, near the town of Conway for access and a reconfiguration of the interchange at I-5 could be needed. Local traffic may need to be consolidated at key cross streets and this could result in some out-of-direction travel for neighborhood traffic.

Bridge from Strawberry Point on North Whidbey Island to North Stanwood Vicinity
The classification of Crescent Harbor Road in the west portion would remain the same and the east section would be upgraded from collector arterial to minor arterial, with an

increase in posted speed limit from 35 and 40 mph to 50 mph. The classification of 300th Street NW would be upgraded from collector roadway to minor arterial with an increase in posted speed limit from 45 mph (30 mph near the Fire Station) to 50 mph. All intersecting streets would stop at the new roadway facility, with some possible change in level of control along the corridor. Signalized intersections are likely to be needed at SR 20, Pioneer Highway/SR 530 and at the I-5 interchange and other changes in traffic control could be needed at Torpedo Road, Reservation Road, and Strawberry Point Road.

Ferry from Whidbey Island to North Stanwood Vicinity

The roadway connections from possible ferry terminal locations on Whidbey Island to SR 20 are expected to be able to accommodate the additional 250-330 vehicles per hour during the peak period, without significant upgrade to the physical roadway or classification. Terminal access from the north Stanwood vicinity would be along the 300th Street NW corridor from Pioneer Highway/SR 530 to the water's edge and onto the bridge/dock. Ferry operations can be expected to impact neighborhood traffic patterns not only for vehicles, but also for pedestrian and bicycle traffic, but to a lesser extent than with bridge and arterial roadway connections.

References

Larson Anthropological Services Limited. September 9, 1999. *Draft State Route 20 North Whidbey Island Access Feasibility Study, Cultural Resources Overview: Island, Skagit, and Snohomish Counties, Washington.* Gig Harbor, WA.

Parker, Patricia L. and Thomas F. King. 1992. *Guidelines for Evaluating and Documenting Traditional Cultural Properties.* National Register Bulletin No. 38. United States Department of the Interior, National Park Service Interagency Resources Division.

North Whidbey Island Access Feasibility Study
Land Use and Economic Development Analysis

Introduction

The Washington State Department of Transportation (WSDOT) identified a vehicle capacity deficiency on the SR 20 corridor and Deception Pass/Canoe Pass bridges linking Fidalgo Island, Skagit County and north Whidbey Island, Island County. The North Whidbey Island Access Feasibility Study is being conducted to evaluate four proposed routes across Skagit Bay that would link SR 20 on north Whidbey Island to Interstate 5. To evaluate the alternatives, various Measures of Feasibility (MOF) were developed in cooperation with the project Policy and Technical Steering Committees that take into consideration social impacts, land use/economic development impacts, financial/economic performance, environmental impacts, and transportation performance.

Five MOF were developed to evaluate land use and economic development impacts:

- LU1-amount of agricultural land affected by right-of-way (ROW) acquisition.
- LU2-amount of timber and mineral resource land affected by ROW.
- EH3-ROW within shoreline jurisdiction.
- ED1-potential number of farms and businesses affected.
- ED2-potential impacts to fish and shellfish harvesting.

This technical memorandum provides an analysis of the land use and economic development impacts associated with the proposed alternatives using these MOF. The findings presented in this technical memorandum will be used by the Policy and Technical Steering Committees to evaluate the feasibility of the proposed alternatives.

Methods

The potential impact on agriculture was assessed by using land use and zoning maps to estimate the amount of designated agricultural land that would need to be acquired for roadway ROW. Estimates were made using the Skagit County Comprehensive Plan Map (March 1, 1999), the Snohomish County Zoning Map (October 8, 1998), and the Island County Zoning Map (undated). ROW acquisition estimates were based on a total required ROW of 200 feet for each alternative.

The potential impact on resource land was assessed by using land use and zoning maps to estimate the amount of designated timber and mineral land that would need to be acquired for roadway ROW. Estimates were made using the Skagit County Comprehensive Plan Map (March 1, 1999), the Snohomish County Zoning Map (October 8, 1998), and the Island County Zoning Map (undated). ROW acquisition estimates were based on a total required ROW of 130 feet for each alternative.

Location of ROW within areas under shoreline jurisdiction were determined by review of the *Skagit County Comprehensive Plan: Shoreline Master Program Element* (Skagit County, 1997), the *Island County Comprehensive Plan: Shoreline Management Element* (Island County, 1998), and the *Snohomish County Shoreline Management Master Program* (Snohomish County, revised 1993).

Potential impacts on farms and businesses were assessed by estimating the number of farms and businesses within ½ mile of each proposed alternative alignment. An initial count was made using 1-inch:1000-feet black and white aerial photographs dated May 1995. A site reconnaissance was conducted on September 14, 1999 to verify the photograph counts.

Information regarding tribal and commercial fish and shellfish harvesting areas was obtained from several sources, including:

- *Washington State Coastal Sensitive Areas Mapping Project: San Juan Islands Booklet.* Washington State Department of Ecology. 1992
- *Puget Sound Environmental Atlas.* PSEP. 1994
- Personal communications with Tribal and WDFW representatives.

The information obtained from these sources was compiled and is shown in Figure LU-1.

Findings

LU1 Agricultural Land Affected

The Island County Comprehensive Plan (1998) designates agricultural lands as Rural Agricultural or Commercial Agricultural. Commercial Agricultural lands are agricultural lands of long-term commercial significance that meet the following criteria: 1) the farm unit is at least 40 acres in size; and 2) at least 50% of the farm unit is comprised of Prime soils; and 3) the farm unit is devoted to active commercial production through cultivation or management; or 4) the farm unit qualifies for designation, except for meeting the minimum coverage of prime soils, and the owner requests designation. Rural Agricultural lands are lands where agricultural activities have been an important and valued use in the past, and will continue to be in the future, but do not meet the criteria for inclusion as lands of long-term commercial significance.

The Skagit County Comprehensive Plan (1997) applies the Agricultural designation to lands in unincorporated Skagit County that are 1) five acres or greater, 2) that contain prime farmland soil as identified by the U.S. Department of Agriculture (USDA) or soil series specified by Skagit County, and 3) a majority of the area falls within the 100-year floodplain as adopted by the U.S. Federal Emergency Management Agency (FEMA). Additional parcels may be designated as Agricultural based on current-use tax assessment, current and past agricultural use; minimal financial commitment to non-farm use, inclusion of special purpose districts (such as diking and drainage districts);

surrounding agricultural land use, and capital investment in agricultural operation improvements.

Within the project area, the Snohomish County Zoning Map (1998) designates some areas as Agricultural-10. These areas were identified in the Agricultural Preservation Plan as farmlands of primary agricultural importance. These areas are characterized by the presence of prime agricultural soils, large ownerships, and farm activity. Their preservation has a high priority within the County.

Bridge from North Whidbey Island to La Conner Vicinity
Approximately 73 acres of agricultural land would need to be acquired for ROW for this alternative. Of these, 3 acres are located in Island County, and 123 acres are located in Skagit County. A total of 112 acres of ROW would be needed for this alternative.

Bridge from Strawberry Point on North Whidbey Island to Conway vicinity via Fir Island
For the Fakkema Road option of alternative, approximately 53 acres of agricultural land would need to be acquired for ROW. Of these, 10 acres are located in Island County (1.1 acres are designated Commercial Agriculture), and 43 acres are located in Skagit County. A total of 117 acres of ROW would be needed for this alternative.

For the Crescent Harbor Road option of alternative, approximately 43 acres of agricultural land would need to be acquired for ROW in Skagit County. No designated agricultural land would be affected on Whidbey Island for this alternative. A total of 118 acres of ROW would be needed for this alternative.

Bridge from Strawberry Point on North Whidbey Island to North Stanwood Vicinity
Approximately 16 acres of agricultural land would need to be acquired for ROW for this alternative in Snohomish County. No designated agricultural land would be affected on Whidbey Island for this alternative. A total of 125 acres of ROW would be needed for this alternative.

Ferry from Whidbey Island to North Stanwood Vicinity
No designated agricultural lands would be acquired for ferry landings in Oak Harbor, Coupeville, or Strawberry Point. Approximately 16 acres of agricultural land in Snohomish County would need to be acquired for ROW for this alternative. A total of 20 acres of ROW would be needed for this alternative. Right of way required for terminals on Whidbey Island was not quantified for this analysis.

LU2 Resource Land Impacts
No designated mineral or forest resource lands are located in the study area.

EH3 Shoreline Impacts
The Shoreline Management Act of 1971designated certain shorelines as shorelines of statewide significance. Shorelines thus designated are important to the entire state. The

Act requires that local Shoreline Master Programs give preferences uses, in the following order, which:

- Recognize and protect the statewide interest over local interest;
- Preserve the natural character of the shoreline;
- Result in long-term benefit to people of the state;
- Protect the resources and ecology of the shoreline;
- Increase public access to publicly owned areas of the shoreline;
- Increase recreational opportunities for the public on shorelines.

Within the study area, shorelines of statewide significance include the Skagit Bay marine shoreline of Snohomish County, Skagit County north to Yokeko Point on Fidalgo Island, and Island County from Brown Point to Yokeko Point. The Skagit River upstream of Skagit Bay to the Skagit-Whatcom County line is also a shoreline of statewide significance.

Bridge from North Whidbey Island to La Conner Vicinity

This alternative would require a Shoreline Substantial Development Permit from Island County for construction in the shoreline area of Skagit Bay along Whidbey Island, and from Skagit County for construction in shoreline areas along Skagit Bay in Skagit County and the North and South Forks of the Skagit Rivers. Each of these shoreline areas is a shoreline of statewide significance.

The Shoreline Master Programs of Skagit and Island Counties stipulate that roadway construction shall be located away from shoreline areas whenever feasible. On Whidbey Island, the affected shoreline areas are designated Shoreline Residential and Aquatic. In Skagit County, the affected shorelines are designated Aquatic and Rural. Roadway and bridge construction in these shoreline areas is inconsistent with the shoreline planning policies of Island and Skagit Counties.

General Use Requirements of the Island County Shoreline Master Program (Section 17.05.045 (2)(4)) prohibits proposals that cause substrate displacement that involves substrate modification through dredging, trenching, or digging in exisiting kelp and eel grass beds. The proposed bridge alignment crosses an exisiting eel grass bed located within Island County jurisdiction. Substrate displacement associated with bridge piling placement within the eel grass bed likely would not be permitted by Island County.

Bridge from Strawberry Point on North Whidbey Island to Conway Vicinity via Fir Island

The Fakkema Road and Crescent Road options of this alternative would both require a Shoreline Substantial Development Permit for construction in the shoreline areas of Skagit Bay along Whidbey Island, and from Skagit County for construction in shoreline areas along Skagit Bay in Skagit County and the South Fork of the Skagit River. Each of these shoreline areas is a shoreline of statewide significance.

The Shoreline Master Programs of Skagit and Island Counties stipulate that roadway construction shall be located away from shoreline areas whenever feasible. On Whidbey Island, the affected shoreline areas are designated Aquatic and Shoreline Residential. In Skagit County, the affected shorelines are designated Aquatic and Rural. Roadway and bridge construction in these shoreline areas is inconsistent with the shoreline planning policies of Island and Skagit Counties.

Bridge from Strawberry Point on North Whidbey Island to North Stanwood Vicinity
This alternative would require a Shoreline Substantial Development Permit from Island County for construction in the shoreline area of Skagit Bay along Whidbey Island, and from Snohomish County for construction in shoreline areas along Skagit Bay in Snohomish County. Each of these shoreline areas is a shoreline of statewide significance.

According to the Snohomish County Shoreline Management Program, crossing of tidelands, shorelands, and marshes, bogs, or swamps for roads and railroads is prohibited unless no viable upland alternative exists (Section 18F, Shoreline Use Activity: Roads and Railroads). Approximately 1.5 mile of bridge would be located in tidelands designated as Conservancy, and 1 mile of roadway would be located in shoreland designated as Rural. Because of the length of bridgespan in tidelands, this alternative likely would not be permitted by the County.

The Shoreline Master Program Island County stipulates that roadway construction shall be located away from shoreline areas whenever feasible. On Whidbey Island, the affected shoreline areas are designated Aquatic and Rural. Roadway and bridge construction in these shoreline areas is inconsistent with the shoreline planning policies of Island County.

Ferry from Whidbey Island to North Stanwood Vicinity
Construction of a ferry landing in the North Stanwood vicinity would require a Shoreline Substantial Development Permit from Snohomish County. Section 9 of the Shoreline Master Program states that the location, design, construction and operation of boating facilities [including piers and docks] should endeavor to minimize any adverse affects on priority habitats, fish and shellfish resources, and the adjacent areas. The proposed 2.5-mile dock in the Stanwood vicinity would be located in intertidal wetlands in Snohomish County shoreline jurisdiction. These wetlands are designated as Priority Habitat by WDFW. Therefore, construction of the proposed dock would be inconsistent with the County's shoreline planning policies.

The ferry landing option located at Strawberry Point, Coupeville, or Oak Harbor would require a Shoreline Substantial Development Permit from Island County, Coupeville, or Oak Harbor, respectively. Construction of piers and docks are permitted uses in these shoreline areas.

ED1 Farm and Business Impacts

This MOF assesses the number of farms and businesses within ½ mile of the proposed alternatives. A farm was identified using the aerial photos by the cluster of buildings on acreage, regardless of underlying zoning.

Bridge from North Whidbey Island to La Conner Vicinity

Approximately 23 farms and 13 businesses are located within ½ mile of this alternative alignment.

Bridge from Strawberry Point on North Whidbey Island to Conway Vicinity via Fir Island

For the Fakkema Road option of this alternative, approximately 18 farms and 12 businesses are located within ½ mile of the alignment.

For the Crescent Harbor Road option of this alternative, approximately 18 farms and 25 businesses are located within ½ mile of the alignment.

Bridge from Strawberry Point on North Whidbey Island to North Stanwood Vicinity

Approximately 22 farms and 11 businesses are located within ½ mile of this alternative alignment.

Ferry from North Stanwood Vicinity to North Whidbey Island

Approximately 4 farms and no businesses are located within ½ mile of this alternative alignment in Snohomish County.

ED2 Commercial Fish/Shellfish Harvesting Impacts

Tribes with commercial shellfish fisheries in this area include the Swinomish, Upper Skagit, and Tulalip Tribes. Principle species of interests are native littleneck clams, spot shrimp, and Dungeness crab.

The Swinomish Tribe harvests native littleneck clams commercially at publicly owned beaches in Penn Cove (WDFW beaches 241-40 and 241-50). Annual harvestable abundance at these two sites is currently estimated to be 8,600 pounds, and 62,000 pounds, respectively. Other sites have been assessed in Saratoga Passage, but commercially viable quantities of clams were not found. They have sought access to another site on U.S. Navy property, east of Oak Harbor, at Forbes Pt. Clam density is high there. The Tulalip Tribes have purchased an island near the mouth of Holmes Harbor at which they hope to develop a shellfish enhancement project - there are not commercially useful quantities of clams there now. A large, non-tribal commercial mussel farm is located in Penn Cove, east of Coupeville.

The tribal fishery for spot shrimp occurs from Rocky Point on Camano Island southward in Saratoga Passage. This pot fishery deploys gear at depths of 150 to 300 feet.

There is a significant commercial Dungeness crab fishery in Skagit Bay and Saratoga Passage, involving both tribal and non-tribal fishermen. Interest and participation in this fishery has increased significantly in the last five years, as the commercial chinook and coho salmon fisheries have been more and more restricted, and the market for crab has improved. This fishery operates inside Deception Pass, throughout Skagit Bay and Saratoga Passage, and is opened by tribal regulation for winter and summer fishing. Pots are deployed in water up to 150 feet deep. The summer tribal harvest allocation alone amounted to 400,000 pounds in 1999.

Because of its shallow depth, Skagit Bay proper is not a significant commercial salmon fishing area. However, all marine waters between Whidbey Island and the adjacent mainland are part of the adjudicated usual and accustomed fishing area of the Swinomish, Upper Skagit, and Tulalip tribes. The relatively deep channel along the northeastern shore of Whidbey Island coast, from Deception Pass to Strawberry Point and the western shore of Camano Island from Rocky Point to Sunset Point, are the primary gillnet fishing areas.

Any construction or development activities that might adversely affect estuarine circulation and productivity, and thus the survival and production of finfish and shellfish species in the Skagit estuary, would be scrutinized by tribal and state resource agencies. There is also concern that ferry traffic across a new route in Saratoga Passage could disrupt fishing activity and cause loss of fishing gear.

Tribal and WDFW technical staff are developing a recovery plan for Puget Sound chinook that deals specifically with harvest management and hatchery production issues in light of the recent threatened listing. Restoration and protection of essential habitat in the Skagit system is essential to the recovery of the ESU, because of its high natural production potential. Prior and ongoing fisheries research in the Skagit system points to factors in the freshwater and estuarine areas that limit chinook production. Restoration planning has focused on re-opening and improving juvenile rearing areas in the Skagit delta and estuary as achievable means to improve chinook production. Proposals to develop new road access and bridge or causeway crossings from the mainland to Whidbey Island would be scrutinized for their impacts on adult and juvenile chinook migration, and juvenile foraging activities.

Commercial and tribal fish and shellfish harvest areas are shown in Figure LU1.

Bridge from North Whidbey Island to La Conner Vicinity
The bridge for this alternative would cross crab and fish harvest areas of Skagit Bay. Bridge construction in the Skagit River delta and estuary could adversely affect juvenile salmon rearing areas that support the chinook fishery.

Bridge from Strawberry Point on North Whidbey Island to Conway vicinity via Fir Island
The bridge for this alternative would cross crab and fish harvest areas of Skagit Bay. Bridge construction in the Skagit River delta and estuary could adversely affect juvenile salmon rearing areas that support the chinook fishery.

Bridge from Strawberry Point on North Whidbey Island to North Stanwood Vicinity
The bridge for this alternative would cross crab and fish harvest areas of Skagit Bay. Bridge construction in the Skagit River delta and estuary could adversely affect juvenile salmon rearing areas that support the chinook fishery.

Ferry from Whidbey Island to North Stanwood Vicinity
Construction of a ferry landing at Coupeville could adversely affect commercial and tribal shellfish harvest areas, depending on the location of the landing. Bridge/dock construction in the Skagit River delta and estuary would adversely affect juvenile salmon rearing areas that support the chinook fishery. Ferry traffic across a new across Skagit Bay would cross fishing areas and could disrupt fishing activity and cause loss of fishing gear.

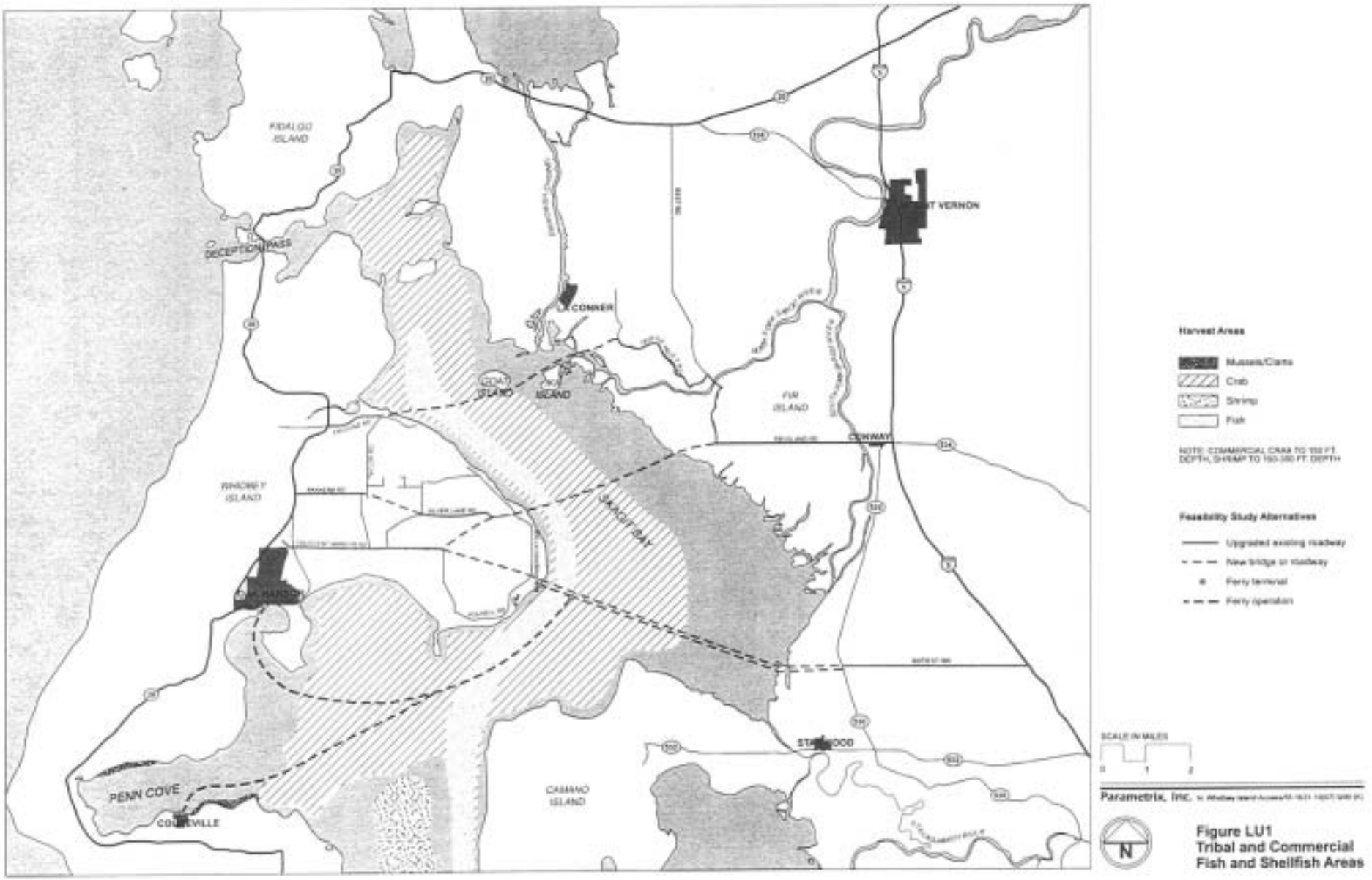


Figure LU1
Tribal and Commercial Fish and Shellfish Areas

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North Whidbey Island Access Feasibility Study
Planning Level Cost Analysis

Introduction

The Washington State Department of Transportation (WSDOT) identified a vehicle capacity deficiency on the SR 20 corridor and Deception Pass/Canoe Pass bridges linking Fidalgo Island, Skagit County and north Whidbey Island, Island County. The North Whidbey Island Access Feasibility Study is being conducted to evaluate four proposed routes across Skagit Bay that would link SR 20 on north Whidbey Island to Interstate 5. To evaluate the alternatives, various Measures of Feasibility (MOF) were developed in cooperation with the project Policy and Technical Steering Committees that take into consideration social impacts, land use/economic development impacts, financial/economic performance, environmental issues, and transportation performance.

Three MOF were developed to evaluate financial costs and funding viability of the alternatives: FE1-planning level construction cost estimate; FE2-annual operation & maintenance cost estimate for the facilities; and FE3-possible revenues from tolls and funding analysis. This technical memorandum includes the planning level construction cost estimate for the alternatives along with estimated annual operations and maintenance costs for the facilities. A review of revenues and funding for the alternatives is presented in the attached technical memorandum prepared by Parsons Brinckerhoff, including an analysis of the financial issues associated with the proposed alternatives using these MOF. The findings presented in this technical memorandum will be used by the Policy and Technical Steering Committees to evaluate the feasibility of the proposed alternatives.

Methods

Planning level construction cost estimates and annual operations and maintenance costs were developed using an estimating spreadsheet developed by WSDOT staff for use in estimating project costs at both the planning stage and the preliminary engineering stage. This cost modeling tool provides a best guess for construction of roadway improvements along the alternative corridors, to complement the cost estimates developed for the bridge elements by Lin & Associates for this study. The roadway and bridge alternatives would be constructed as two-lane rural highway facilities with shoulders as well as pedestrian and bicycle facilities in the bridge section of the alternative. The proposed right of way section of 202 feet was provided by WSDOT staff to not only accommodate the initial two-lane facility construction, but also to provide for possible expansion of the corridor, should that be required by future travel demands. Attached is a figure showing the proposed cross sections for both the roadways and the bridge deck.

Attached is a technical memorandum prepared by Lin & Associates outlining the possible bridge elements and costs for the four alternatives crossing Skagit Bay, including the

construction of a bridge/dock to serve a possible ferry operation to Whidbey Island. Some of the limitations and considerations that affect all alternatives are 1) the range in the amount of land exposed between high and low tide, 2) a vertical height limit of no more that 250' above datum, established by the FAA for air safety issues, 3) a vertical clearance of 65' to 75' within the navigation channel, and 4) constructability issues. All alternatives involve crossing over mud flats, water with shallow spots, and a navigation channel. Precast concrete decked girder, steel span, and prestressed concrete slab are the three recommended bridge types considered in the crossing from North Whidbey Island to the mainland. The lengths of each type will vary depending on the alternative. In the spans leading up to and immediately after the navigation channel, a bridge consisting of prestressed concrete decked girders or "super span" girders is recommended. Precast concrete girder bridges are easy to construct and require relatively less time for placement than reinforced concrete bridges. For the main span crossing the navigation channel, a cable tied arch, steel plate girder, or cable stayed bridge is recommended in order to accommodate the required 200' to 300' span length.

A work barge requires a minimum water depth of approximately 5', and will not be able to reach all required areas in Skagit Bay during low tide. Therefore, in areas where the bridge goes over mud flats, a barge can not be used as a work platform for pile driving equipment. In these areas, a prestressed concrete slab bridge made of relatively short span lengths is recommended in these areas. Construction sequence for this area would start with pile driving equipment on land or at the end of a bridge.

The alternatives would follow the route of existing roadways through many sections of the corridor. For the purposes of this planning level construction cost estimate, we have included the cost of reconstructing the existing roadways through the corridor. Right of way would be purchased for the entire 202 feet, less any existing public right of way along the existing roadways in the corridor. Crescent Harbor Road and 300th Street NW were credited with a 60-foot right of way and other roadways were credited with a 40-foot right of way.

Ferry operations would include construction of two terminal facilities as well as ferry vessel(s) needed for the run. Three locations for possible ferry landing on Whidbey Island were reviewed on a sketch planning level, at Strawberry Point, in Oak Harbor and in Coupeville. Differences between the three ferry alternatives are discussed in detail in the Parsons Brinckerhoff memo dated April 1999. Two ferries would be needed for adequate operations using either the Oak Harbor or Coupeville terminal locations on Whidbey Island, as these two would have 8 and 7 mile run distances, respectively. A single ferry could provide service to the Strawberry Point area due to the short crossing distance. Cost data for ferry operation for this cost summary is based on the Parsons Brinckerhoff memo.

Findings

FE1 Planning Level Construction Cost Estimate

The estimated construction cost estimate for the four alternatives for new vehicular access to North Whidbey Island include the following cost elements:

- Roadway construction costs
- Bridge construction costs
- Right of Way costs
- Traffic Mitigation costs
- Ferry Vessel costs
- Ferry Terminal costs

Some minor mitigation costs are included in these cost estimates, for a limited amount of wetland mitigation or air quality or noise impacts mitigation. Mitigation costs for significant environmental issues or possible impacts have not been reflected in these planning level cost estimates. The findings in the environmental resources technical memorandum reflect the significant potential for impacting sensitive wetland, wildlife and fishery habitats of Skagit Bay.

Estimates for operations and maintenance costs for the alternatives are the sum of estimated roadway O&M costs (from the WSDOT planning cost estimating worksheet), bridge O&M costs based on 1998-9 data for the I-90 floating bridge, and ferry operations costs for both ferry vessel and ferry terminal operations. Annual roadway O&M costs are estimated at $6,800 per lane mile, annual bridge O&M costs are estimated at $80,400 per lane mile, ferry vessel O&M costs are based on vessel type (Issaquah class) at $4.6 million per vehicle per year, and ferry terminal O&M would be $2.3 million per year per terminal. Where two ferries would be required for alternative operation, O&M costs reflect a value for two ferries.

Table FE-1 is a summary of the planning level construction and annual operations & maintenance cost estimates for the four alternative new corridor connections to North Whidbey Island, in current 1999 dollars.

Table FE-1
Planning Level Construction Cost Estimates and Annual Operations & Maintenance Costs

	New Corridor Alternatives to North Whidbey Island					
Cost Element, in $millions	North Bridge to South La Conner Vicinity	Middle Bridge to Fir Island Road and Conway	South Bridge from Strawberry Point to North Stanwood Vicinity	Ferry from North Stanwood Vicinity to Strawberry Point	Ferry from North Stanwood Vicinity to Oak Harbor	Ferry from North Stanwood Vicinity to Coupeville
Roadway	$ 41.8	$ 43.8	$ 52.0	$ 4.2	$ 4.2	$ 4.2
Bridge*	$ 176.7	$ 126.0	$ 193.0	$ 80.1	$ 80.1	$ 80.1
Right of Way	$ 9.4	$ 10.0	$ 11.9	$ 1.0	$ 1.0	$ 1.0
Traffic Mitigation	$ 3.2	$ 3.6	$ 3.4	$ 0.4	$ 0.4	$ 0.4
Ferry Vessel**				$ 76.0	$ 152.0	$ 152.0
Ferry Terminal**				$ 60.0	$ 60.0	$ 60.0
Planning Level Construction Cost Estimate	**$ 231.1**	**$ 183.4**	**$ 260.3**	**$ 221.7**	**$ 297.7**	**$ 297.7**
Estimated Annual Operations & Maintenance Costs	**$ 1.4**	**$ 1.1**	**$ 1.4**	**$ 7.8**	**$ 12.4**	**$ 12.4**

* Lin & Associates Bridge Alternatives Technical Memo, September 1999

** Parsons Brinckerhoff Preliminary Ferry Alternative Evaluation, April 1999

North Whidbey Island Access Feasibility Study
Preliminary Ferry Alternative Evaluation

Introduction

This technical memorandum is part of the overall study of additional access alternatives to North Whidbey Island. As part of an on-going planning effort, this memorandum serves to document the technical analysis for the ferry alternative portion of the study. Earlier parts of the study have narrowed the potential list of alternative ferry terminal locations. As a result, this technical analysis was performed under the assumption that one primary mainland terminal would be located in the general vicinity of Arrowhead Beach (access would be provided via a bridge from the mainland, not via Camano Island) and three general site locations would be investigated on Whidbey Island. Given the topography of the Island and the difficulty of land-side connections, the locations for island terminals fall in the general areas of the Oak Harbor, Coupeville and Strawberry Point.

The level of detail for this analysis is conceptual and the analysis, although technical, should be reviewed in this context. Potential terminal sites are proposed for general locations only. No specific terminal siting studies have been performed. The locations shown in this study were selected only to provide a starting point for the operational analysis and to show the implications to vessel throughput for different terminal pairs and corresponding route lengths. More detailed analysis could be undertaken if the entire ferry alternative is not viewed as fatally flawed due to high capital costs.

Capital and operating costs are key factors that will be used in the comparison of the alternative bridge and ferry transportation options. Since ferry terminals are built infrequently, actual construction and design costs for a similar facility are not available. However, Washington State Ferries (WSF) did conduct an extensive feasibility study for a new Edmonds ferry terminal in 1991 which included a new facility at Edwards Point. Cost estimates for selected items were taken from the Edmonds Terminal Study and used as a starting point for the conceptual costs used in this study.

Key Findings

The ferry alternative would require a very large capital outlay. In addition to the 5.5 mile long bridge (which would be similar to portions of the other bridge alternatives), the alternative would require the construction of one or two new ferries (depending on the selected route) and two new terminals. The conceptual cost estimates for the alternative's components are as follows:

- Bridge $____,_____,_____
- Terminals (2) $60,000,000
- Ferries (2) $76,000,000 (assumes one Issaquah Class vessel)
- Total Cost $____,_____,_____

The bridge approach would experience the same environmental and construction difficulties associated with all of the bridge alternatives. Construction in a tide flats area may eliminate the use of barges and would necessitate a sequential construction staging. The mainland ferry terminal would then be built at a location 5.5 miles from shore, causing its own construction operational difficulties.

The ferry operations, while technically feasible, would be highly unusual. By locating the mainland terminal 5.5 miles off-shore, pedestrian access would essentially be eliminated unless shuttle operations were provided. In addition, some type of incident management would have to be considered for stalled vehicles or accidents. Vehicle holding and storage areas which are typically located on shore at other terminals would all need to be located at the terminal due to the long access time resulting from the off-shore terminal location. This would result in a relatively large terminal footprint.

From an operational standpoint, the best route alternative (assuming a proper terminal site on Whidbey Island could be found) is Route 3 which goes between the Arrowhead Beach terminal and Strawberry Point. The route length is approximately one-seventh the length of the other routes. This results in a much shorter crossing time and allows much higher throughput with one smaller, less costly Issaquah Class vessel.

Initial Terminal and Route Locations

Mainland Terminal

Due to a variety of other constraints identified in earlier parts of the study, the terminal for the mainland side would be located in the vicinity of Arrowhead Beach. The topography of the area make the location of a ferry terminal difficult. Skagit Bay is extremely shallow and is characterized by mud flats extending out from the shoreline for approximately 5 to 5.5 miles. The potential for dredging this area to allow ferry access closer to shore has been eliminated due to environmental concerns. The location of a ferry terminal on Camano Island has been eliminated as a possibility also due to the concern over the impacts of ferry related through-traffic and social impacts to existing communities at possible terminal locations. As a result, the best remaining location for a ferry terminal is approximately 5.5 miles off shore just north of Arrowhead Beach. This location clears the tide flats and provides an acceptable depth for ferries accessing the terminal.

Access would be provided to the mainland terminal through the use of a long bridge extending from the shoreline approximately 5.5 miles out into Skagit Bay in order to reach a location with water depth suitable for a ferry terminal. The construction of a bridge in this location has its own design, construction and environmental concerns. However, for the purpose of this document, only the capital, operation and maintenance costs for the access bridge will be addressed as part of the ferry alternative.

General Terminal Features

A ferry terminal would have many of the traditional features included for most terminals in the system. In particular, it is assumed that terminals for this route would require the following major features:

- Two docking slips
- One tie-up slip
- Two toll booths (on the east side terminal)
- On-dock holding equivalent to at least twice the vessel capacity to facilitate vehicle storage, sorting and loading for the mainland terminal.
- Improvements to roadways between the terminal and existing street network.

Unique Features and Problems Associated with the Mainland Terminal

The long bridge separating this proposed terminal with the mainland poses numerous operational issues for WSF. The distance from the mainland requires that all vehicle holding would be located at the terminal. As a result of these requirement for vehicle storage at the terminal, the over-water coverage of the terminal would be significant. Pedestrian access to the ferry would have to be either eliminated or supported with some type of shuttle operation. Another option would be to allow pick-up and drop-off at the terminal area. This would necessitate the location of the toll booths at the dock and the construction of a turn-around area on the dock for autos and potentially transit vehicles. A five-mile sidewalk is not acceptable from a safety standpoint. Due to the length of the bridge, some type of incident management would have to be considered for vehicle breakdowns or accidents.

Whidbey Island Locations

Due to the conceptual nature of this study, routes shown in Figure 1 represents potential corridors of potential bridge/terminal locations that would be refined more clearly in future studies if the entire ferry/bridge alternative survives the fatal flaw analysis. The selection of a general terminal location is necessary in order to provide a basis for the calculation of crossing times and route locations. As a result, three general areas were selected as potential sites for the Whidbey Island terminal locations. The three areas have not gone through any detailed terminal siting studies and were selected to represent the general routing and route distances alternatives. Three general locations shown on Figure 1 include the vicinity of Oak Harbor, Coupeville and an area just south of Strawberry Point. Route lengths differ depending upon the ultimate destination. Figure 1 presents the general areas considered for terminal locations and approximate distances associated with each route.

Oak Harbor

As the population and employment center of the Island, Oak Harbor represents one of the primary alternative locations for a new ferry terminal. A terminal located in this general vicinity, would serve existing city and provide convenient access to Highway 20. Vessel navigation in Oak Harbor would have to be investigated further if the ferry alternative is

to be investigated at a greater level of detail. The route length assumed for this general location is approximately 8 miles.

Coupeville South

The shoreline area just south of Coupeville represents a second potential area for a WSF terminal on Whidbey Island. Unlike other parts of the island, the area is much closer to sea level and does not have the high bluffs and embankments near the water that would restrict the placement of a ferry terminal or roadway access to the terminal. Route length associated with this general terminal area is approximately 7 miles.

Strawberry Point

Much of the area near Strawberry Point is not suitable for a ferry terminal. High bluffs and steep embankments limit the potential areas for land-side access. However, there are several locations where the topography of the land allows for a potential ferry terminal site. In particular, the area just south of Strawberry Point (see Figure 1) includes a marina and access roadway. This area has topography that is acceptable for the construction of a ferry terminal. The main benefit of a terminal in this location would be the much shorter crossing distance. A route to this location would be approximately one mile between the terminals. Access to Highway 20 from the terminal would require an approximate 8 mile trip on county roads around the Whidbey Island Naval Air Station facilities at Crescent Harbor.

Areas Eliminated from Consideration

Crescent Harbor

This site provides good access from the land side, generally favorable navigation and a long beach with a variety of potential terminal locations. The shorter route distance provides some travel time savings for the vessel crossing time when compared to Oak Harbor or Coupeville. In addition, the configuration of the bay would allow for easy navigation and docking. However, due to concerns regarding the Navy's use of the bay for operations and training exercises, this area was eliminated from further consideration. (See appendix A for correspondences regarding the Navy's position on ferry terminal location in Crescent Harbor.)

Operational Analysis

A conceptual operations analysis was performed for the three potential routes based on two different vessel sizes and the three route lengths. Table 1 presents the results of the analysis. Rather than attempting to prepare specific ferry ridership forecasts for this document, an analysis of the potential throughput for each route/vessel combination was made to determine the ferry/bridge alternative's capacity to meet forecasted future demand to North Whidbey Island. This throughput can then be compared to the other bridge options during the feasibility analysis.

Factors included in determining the throughput of the selected ferry alternatives include the following:

- Vessel Size
- Route Length
- Vessel Speed
- Load/Unload Time
- Daily Peaking Characteristics for Similar Routes
- Number of Vessels

Two vessel service was assumed for all the proposed routes except Route 3 based on typical WSF operations. An expanded Issaquah Class ferry was used for the large vessel scenario as the Jumbo Class vessel is clearly too large to serve this route. However, it is anticipated that an Issaquah vessel would be the most probable vessel to assign to this route due to the relatively short crossing distance. It should also be noted that the small vessel scenario uses an unexpanded Issaquah class vessel with approximately 100 vehicle per vessel capacity. Due to the extremely short length of Route 3, it was necessary to evaluate the impact of a smaller vessel on Load/Unload times which make up the vast majority of the overall crossing time.

Load/Unload times were based on actual observation taken at the Colman Dock terminal for Jumbo Class vessels. Loading rates per vehicle were then calculated. Loading rates were increased slightly to account for the less efficient loading operations for Expanded Issaquah versus Jumbo ferries. Vessel speeds were taken from the two year operations report and adjusted to reflect maneuvering times. Overall trips per day were adjusted to reflect likely reductions in service during off-peak hours. The resulting forecasted trips per day estimates were then compared with routes of similar length currently in the WSF system (Bainbridge-Seattle, Clinton-Mukilteo, Southworth-Vashon-Seattle and Point Defiance-Tahlequah). The resulting vehicle throughput for the proposed routes were compared to existing WSF ridership data as a check for reasonableness.

Capital Costs

Vessel capital costs were provided by WSF department of budget. Terminal capital costs were estimated based on a review for cost estimates prepared for a variety of WSF projects including:

- Alternative Site Feasibility Analysis for Edmonds Ferry Terminal
- Clinton Ferry Terminal Study
- Waterfront South Master Plan.

Table 2 presents the estimated capital costs for two vessel classes, the terminal and the access bridge on the east side.

Operations and Maintenance Costs

Vessel and terminal O&M costs were provided by WSF department of budget. These annual costs are shown in Table 2 along with anticipated revenue.

Annual Revenue

The ability for fare revenue to cover operating costs varies greatly depending on the terminal, the vessels serving the route (due to impacts of crew size on operating costs) and the overall demand for ridership on the route. Depending on ridership levels, fare revenue should be able to cover between 70% to 100% of operating costs.

Table 1 – Operational Analysis

Description	Approximate Distance (in miles)	Vessel Type	Vehicle Capacity	Average* Vessel Speed (in miles/hour)	Crossing Time (in minutes)	Load/Unload Time (in minutes)	Total** One-way Crossing Time	Number of Vessels	Maximum One-Way Trips/Day (20 hours)***	Service Frequency (trips/hour)	Maximum Two-Way Daily Throughput** (veh/hour)
Large Vessel Scenario											
Route 1 Tide Flats to Oak Harbor	8	Jumbo	220	20	24	16	40	2	51	2.55	7,293
Route 2 Tide Flats to Coupeville	7	Jumbo	220	20	21	16	37	2	54	2.72	7,779
Route 3 Tide Flats to Strawberry Point	1	Expanded Issaquah	130	15	4	12	16	1	64	3.19	5,387
Small Vessel Scenario											
Route 1 Tide Flats to Oak Harbor	8	Expanded Issaquah	130	18	27	12	39	2	53	2.64	4,453
Route 2 Tide Flats to Coupeville	7	Expanded Issaquah	130	18	23	12	35	2	58	2.89	4,884
Route 3 Tide Flats to Strawberry Point	1	Issaquah	100	15	4	11	15	1	68	3.40	4,420

*Average Vessel Speed includes maneuvering time. The extremely short Route #3 has a lower average speed due to the higher percentage of total trip time spent docking when compared to other routes.
**One-way crossing time includes vessel loading time on the beginning of the one-way trip and vessel unloading at the end of the trip.
***Assumes the assignment of one 16/hour boat and one 24/hour boat for the two-boat alternative, and one 24/hour boat with 4 hours of unscheduled service for the one-boat option. Total trips was also reduced from absolute maximum to reflect need for recovery time.
** Assumes peaking in vehicle demand limits capacity by 35%

Note: the very short distance for Route 3 would make a two-vessel operation infeasible.

Table 2 – Capital and Annual Operating Costs

Capital Costs

	Cost/Vessel *(in 1999 $s)*	Number of Units	Total Cost
Vessel (Issaquah)*	$76,000,000	1	$76,000,000
Terminal	$30,000,000	2	$60,000,000
Eastside Access Bridge (cost to be determined)		1	
Total			$136,000,000

Vessel Operations and Maintenance

Vessel	Cost/vessel hour	Total Annual Vessel/hours**	Number of Vessels Operating	Annual Vessel Operations Costs
Jumbo	$858	7300	2	$12,526,800
Issaquah	$639	7300	1	$4,664,700

Terminal Operations and Maintenance	$2,300,000
Total Annual Operations and Maintenance	$6,965,000

*Jumbo Class vessels have an approximate cost of $100,000,000 in 1997 dollars. However, Issaquah Class vessels are the most likely to serve this route.

** Assumes and average 20 hours of service per day, 365 days a year.

Note: Depending on the vessels ultimately selected for the route and the annual ridership the fare revenue could cover approximately 70% to 100% of operating costs based on experience with other WSF routes.

North Whidbey Island Access Feasibility Study
Summary of Wetland, Wildlife & Fishery Resources

Introduction

Washington Department of Transportation (WSDOT) is evaluating potential options for enhancing access between Interstate 5 and SR 20 on North Whidbey Island as part of the North Whidbey Island Access Feasibility Study. Four route alternatives are being considered: (1) A bridge from North Whidbey Island to the La Connor vicinity, (2) a bridge from Strawberry Point on Whidbey Island to Conway, (3) a bridge from Strawberry Point to the North Stanwood vicinity, and (4) a ferry dock from the North Stanwood vicinity. These alternatives involve new road construction, upgrading existing roads, and construction of new bridges or ferry terminals (docks).

This report summarizes existing wetland, wildlife and fish resources, including Priority Habitat and Species (PHS) as identified by the Washington Department of Fish and Wildlife (WDFW), that occur along each of the routes. Also described are potential impacts and regulatory compliance issues that could occur if any of the proposed transportation improvements are implemented. Information provided herein is based on preliminary review of existing maps and documents that describe the affected area. Additional investigation including on-site field investigation would be needed to verify the information and fully document affected resources.

Methods

The proposed alternatives were overlaid on National Wetland Inventory (NWI), PHS maps and the Puget Sound Environmental Atlas to identify wetland, wildlife and fish resources that potentially could be affected by each alternative. Existing resources within 0.5 mile of the roadway were identified with particular attention paid to those resources in the direct path of the proposed right-of-way. Resources that could be affected by the project are grouped into two categories: those that would be affected by improvement of existing roads, and those that would be affected by new construction. Impacts of new construction would likely be more significant.

Resource Overview

Wetland Resources

All of the proposed routes will require construction of 2.5 to 3.5 miles of bridge over the estuarine wetlands of Skagit Bay (Figure 1). Included in these wetlands are priority habitats such as eelgrass beds and intertidal mudflats, which provide habitat for a number of marine and benthic organisms. In addition to these saltwater wetland resources, there are numerous freshwater wetlands in the direct path of each of the proposed routes and between 18 and 60 individual wetlands within 0.5 mile of the proposed roadways. Riparian wetlands along the North and South Fork Skagit River could also be affected by two Alternatives 1 and 2.

Wildlife Resources

A total of 11 bald eagle territories with 21 nests are located within 0.5 mile of the proposed alternatives (Figure 2). Affected territories include Conway, Coupeville, Dodge Valley, Dugualla, Dugualla Bay North, Dugualla Bay South, English Boom, Ika Island, Oak Harbor, Polnell Point, and Stanwood. Alternative 1 is within 0.5 mile of five bald eagle territories and eleven nests; Alternative 2 is within 0.5 mile of two bald eagle territories and three nests; Alternative 3 is within 0.5 mile of four territories and three nests; and Alternative 4 is within three to four territories and from one to three nests (depending on the option). Site visits would be necessary to determine line-of-sight distance from the project areas to the nests

In addition to the bald eagle, which is a federally listed threatened species, several other wildlife species protected under the federal Endangered Species Act occur in the project area. These include the marbled murrelet, stellar sea lion, humpback whale, and leather back sea turtles. Marbled murrelets may forage in Skagit Bay; however, WDFW does not identify any occurrences within 0.5 mile of the proposed alternatives. Steller sea lions, humpback whales, and leatherback sea turtles occasionally occur in the Puget Sound though rarely, and WDFW does not indicate any occurrences in Skagit Bay.

WDFW also identifies significant waterfowl habitat in the estuarine wetlands of Skagit Bay. These estuarine wetlands provide foraging habitat for numerous shorebirds and terrestrial wildlife.

Fish Resources

Two fish species that receive federal protection under the ESA occur within the area. These are the federally threatened chinook salmon and bull trout, which is currently proposed as threatened. In addition, eight fish species that occur in the vicinity are candidates for protection under the ESA. These are coho salmon, Pacific herring, Pacific cod, Pacific hake, walleye pollock, and brown, copper, and quillback rockfish. Listing assessments for these candidate species are expected as early as February 2000, at which time some of these species may be proposed for listing under the ESA. Candidate species included are in this analysis due to the potential of species to become listed during the life of the project.

Additional priority fish species that may occur within the vicinity of the alternatives include chum salmon, sockeye salmon, coastal cutthroat trout, Dolly Varden, steelhead, pink salmon, Bocaccio rockfish, canary rockfish, china rockfish, greenstriped rockfish, redstripe rockfish, tiger rockfish, widow rockfish, yelloweye rockfish, yellowtail rockfish, lingcod, Pacific sand lance, surf smelt, English sole, and rock sole.

All four alternative routes traverse surf smelt and Pacific herring spawning beaches along the east shores of Whidbey Island. Additionally, Pacific sand lance spawning beaches occur at the west end of Alternatives 1, 2, and 4. Refer to Figure 3 for the combined distribution of sand lance, surf smelt and Pacific herring spawning beaches in the study area.

EXISTING CONDITIONS

Existing conditions for each alternative are described below and summarized in Table 1.

Alternative 1- Bridge from North Whidbey Island to the La Conner Vicinity

Alternative 1 is the northern-most route of the four proposed alternatives. Its alignment is from SR 20 east on Frostad Road and continues on a new 4.25-mile bridge over Skagit Bay. The bridge runs adjacent to Goat and Ika Islands then connects to Dodge Valley Road in the vicinity of La Conner. The route continues south and east using Dodge Valley and Fir Island Roads and an additional new bridge across the North Fork Skagit River to reach Interstate 5 in Conway.

Existing Roads to be Improved

Existing roads cross the South Fork Skagit River, Dry Slough, and an unnamed slough just north of Conway, all of which are salmon bearing streams. The Skagit River basin is an important producer of chinook salmon and bull trout, and contains some of the largest natural runs of these federally protected species in Puget Sound. The existing roadway also crosses five emergent and shrub-scrub wetlands and is within 0.5 mile of another 20 emergent, shrub-scrub, and forested wetlands.

Two bald eagle territories are traversed by the existing road: Dodge Valley territory, which contains seven nests. Six of the nests in this territory are within 0.5 mile of the road. Conway bald eagle territory contains one nest that is greater than 0.5 mile from the road.

New Right-of-Way to be Constructed

Construction of the new bridge across Skagit Bay will traverse approximately 3.5 mile of estuarine intertidal habitat in Skagit and Dugualla Bays. Estuarine habitat extends 0.5 mile or more on both sides of the proposed bridge and includes a harbor seal haulout. A portion of the bridge would cross eelgrass beds on the shore of Whidbey Island. Eelgrass beds area sensitive habitat for marine wildlife and fish, including chinook salmon and Pacific herring, and extend approximately 0.5 mile south and 2 miles north of the proposed bridge. Additional candidate fish species that may occur within the area are coho salmon, Pacific cod, Pacific hake, walleye pollock, and brown, copper, and quillback rockfish. Three priority fish species, Pacific sand lance, Pacific herring, and surf smelt, are documented as spawning along the east shores of Whidbey Island at the west end of the bridge. Much of the intertidal habitat of Skagit and Dugualla Bay is recognized by WDFW as important wintering and staging habitat for waterfowl.

The new bridge is near Goat and Ika Islands and traverses Ika Island bald eagle territory with five bald eagle nests within 0.5 mile of the bridge. These unique islands are free of most mammalian predators and are therefore considered extremely good foraging habitat for

hawks and eagles. If the new bridge is adjacent to the islands, it could potentially provide access for other predators such as coyotes, foxes and bobcats, which would increase competition for prey and reduce the islands foraging quality for raptorial birds. A second bald eagle territory, Dugualla Bay North territory on Whidbey Island, is also traversed by the new bridge. This territory contains five nests, all of which are greater than 0.5 mile.

This Alternative also includes a second bridge over the North Fork Skagit River and its associated riparian wetlands. The North Fork provides important migration and rearing habitat for salmon and char, including chinook and the bull trout. The majority of salmon and char that inhabit the Skagit basin migrate through the North Fork channel because it receives approximately 60% of the basin's flows, making it an attractive corridor (Williams et al. 1973). Important rearing habitat for chinook and bull trout is found throughout the network of sloughs and in the estuary.

Alternative 2 - Bridge from Strawberry Point to Conway

Alternative 2 has two options on Whidbey Island for connection to the new bridge over Skagit Bay. Option 2A is aligned east from SR 20 on Fakkema Road to Silver Lake Road and continues on the new 4-mile bridge over Skagit Bay. Option 2B would be aligned on Crescent Harbor Road to access the new bridge. The new bridge would connect to Fir Island Road and ultimately Interstate 5.

Habitats and species common to both options of Alternative 2

Existing Roads to be Improved

This alternative crosses the South Fork Skagit River, Dry Slough and the unnamed slough, which are accessible from Skagit Bay and used by rearing and migratory fish, including chinook salmon and bull trout. The existing road also crosses approximately 0.25 mile of emergent and forested wetlands associated with the river and Conway bald eagle territory. The only known nest in the territory is greater than 0.5 mile from the road.

New Right-of-Way to be Constructed

The proposed new bridge would cross approximately 2.5 miles of estuarine intertidal habitat in Skagit Bay and includes approximately 1.5 miles of eelgrass beds. The eelgrass bed in this alternative are expansive and would be difficult to avoid without significant changes to the proposed path of the roadway. Estuarine habitat extends 0.5 mile or more on both sides of the proposed roadway. This area is recognized by WDFW as a significant wintering and staging area for waterfowl and the eelgrass beds are considered a priority habitat. Three priority fish species, Pacific sand lance, Pacific herring, and surf smelt, are documented as spawning along the east shores of Whidbey Island in the vicinity of the roadway. The proposed route crosses Dugualla bald eagle territory on the east shore of Whidbey Island. This territory contains six nests, three of which are less than 0.5 mile from the roadway.

Habitats and species common to Option 2A

This option crosses one emergent wetland and is within 0.5 mile of another ten emergent and open water wetlands. New road to be constructed is within 0.5 mile of eight emergent and open water wetlands.

Habitats and species common to Option 2B

Existing road to be improved is within 0.5 mile of Polnell Point bald eagle territory. There are five nests in this territory, one of which is less than 0.5 mile from the roadway. There are approximately six emergent, and shrub-scrub wetlands within 0.5 mile of the existing roadway, and another five wetlands within 0.5 mile of new construction required for this option. One of the emergent wetlands is a large system (80+ acres) that is recognized by WDFW as significant waterfowl habitat.

Alternative 3- Bridge from Strawberry Point to the North Stanwood Vicinity

Alternative 3 is the southern-most of the proposed alternatives. It is aligned east from SR 20 on Crescent Harbor Road and requires a new right-of-way to Strawberry Point where it connects with a 6-mile new bridge over Skagit Bay. The bridge connects to 300th Street NW in the North Stanwood vicinity and heads east to Interstate 5.

Existing Roads to be Improved

This alternative uses existing 300th Street NW, which crosses Freedom and Church Creeks two times each. Both of these creeks are accessible from Skagit Bay and are used for rearing by fish species, which may include bull trout and chinook salmon. The existing road also crosses approximately six emergent and forested wetlands. Within 0.5 mile of this alternative there are approximately 60 emergent and shrub-scrub wetlands, most of which are in the North Stanwood vicinity. One of the emergent wetlands on Whidbey Island is a large system (80+ acres) that is recognized by WDFW as significant waterfowl habitat.

The route is within 0.5 mile of Polnell Point bald eagle territory. There are five nests in this territory, one of which is less than 0.5 mile from the roadway.

New Right-of-Way to be Constructed

The bridge over Skagit Bay would cross approximately 2.5 miles of intertidal estuarine habitat. Estuarine habitat extends 0.5 mile or more on both sides of the proposed bridge and includes significant eelgrass beds on the south side of the proposed bridge. This area is recognized by WDFW as significant habitat for waterfowl, providing wintering and staging areas for migrating birds. There are nine emergent freshwater wetlands within 0.5 mile of proposed roadway. Additionally, the proposed roadway traverses the Pacific herring and surf smelt spawning beaches along the east shores of Whidbey Island.

The Skagit Bay bridge is proposed within 0.5 mile of English Boom bald eagle territory and traverses Stanwood and Dugualla Bay South bald eagle territories. English Boom and Stanwood territories contain five nests, all of which are greater than 0.5 mile from the proposed roadway. Dugualla Bay South territory contains six nests, two of which are within 0.5 miles of the proposed roadway.

Alternative 4 - Ferry Operation from the North Stanwood Vicinity

The alignment for the Ferry alternative is similar to Alternative 3; however it consists of an extended dock from the North Stanwood vicinity and crosses the intertidal waters of Skagit Bay to reach a docking facility in the deeper channel. On Whidbey Island there are three possible options for a ferry docking facility: Option A is at Strawberry Point; Option B in Oak Harbor; and Option C in Coupeville.

Habitats and Species Affected by All Options of the Ferry Alternative

Existing Roads to be Improved
Similar to Alternative 3, this route uses existing 300th Street NW. However, no significant improvements will be necessary for this necessary for this portion of the alternative.
New Right-of-Way to be Constructed
New construction for this alternative would include an extended dock on the same alignment as the bridge for Alternative 3. The 4.5-mile dock would end at the deep water channel and affect the same wetland, wildlife and fish resources as the bridge in Alternative 3, with the exception of the herring and smelt spawning beaches on Whidbey Island.

Habitats and Species Affected by Option 4A
This option would require the construction of a ferry dock on Whidbey Island, and a connecting road from Strawberry Point Road. The dock would traverse approximately 800 feet of estuarine wetland, and spawning beaches for Pacific herring and surf smelt spawning common to Alternative 3. Additionally, the dock traverses Dugualla Bay South bald eagle territory which has six nests, two of which are within 0.5 mile of the connecting road.

Habitats and Species Affected by Option 4B
The ferry dock on Whidbey Island would be located in Oak Harbor Bay. The dock would extend over approximately 0.25 mile of estuarine wetland, which includes some eelgrass beds, and be within 0.5 mile of four emergent and shrub-scrub wetlands. The dock would also traverse Oak Harbor bald eagle territory, and surf smelt and Pacific sand lance spawning beaches.

Habitats and Species Affected by Option 4C
The ferry dock would be located in the City of Coupeville on the shore of Penn Cove. Penn Cove is an estuary wetland with eelgrass beds and includes surf smelt and Pacific sand lance spawning grounds.

POTENTIAL IMPACTS

Based on the information available at this time, it appears there could be significant impacts on wetland, wildlife, and fish resources with any/all of the alternatives. Considerable additional investigation would be needed to fully evaluate the impacts for each of the proposed routes and identify the least environmentally damaging practicable alternative. General findings relative to anticipated impacts are listed below.

All of the proposed alternatives would have impacts on sensitive wetland, wildlife, and fishery habitats associated with Skagit Bay and its tributaries - These habitats are considered extremely valuable because of the important ecological functions they perform. Construction and operation of a new (or improved) road, bridge, and/or ferry terminal along any of the proposed routes could have significant impact on these habitats, both in terms of extent (i.e., area of wetland loss) and nature (i.e., potential "incidental take" of a threatened or endangered species).

Potentially significant impacts common to all of the alternatives would include:

- Filling of freshwater wetlands (including forested and riparian wetlands)
- Loss of intertidal estuarine wetlands
- Disturbance of nesting bald eagles
- Loss of priority waterfowl habitat
- Potential impacts on shellfish production and survival
- Reduction in the forage base for juvenile salmon
- Creation of new barriers to salmon migration (bridges, culverts, etc)
- Loss of documented surf smelt spawning habitat
- Shading/filling of documented eelgrass beds smelt/ Pacific herring habitat
- Alteration of salmon-bearing streams (i.e., new road crossings)
- Water quality degradation associated with increase of impervious pollution-generating surfaces.

Although most of the major impacts are common to all alternatives, impacts specific to individual alternatives include the following:

- Alternatives 1, 2, and 4 would cause impacts to sand lance spawning habitat. There is no documented habitat for sand lance in the vicinity of Alternative 3.
- Alternative 1 would have additional impacts on foraging raptors (including eagles), because it could allow predators access to Goat and Ika Islands.
- Alternative 4 could have additional impacts on intertidal and shoreline habitats due to ferry operation (i.e., propeller scour and wave action).
- Alternative 4 could disrupt fishing activity and cause loss of fishing gear as ferries cross a new route in Saratoga Passage.
- Alternative 1 and 2 would cross eelgrass beds, with Alternative 2 crossing a considerable amount. Alternative 3 and 4 would be within 0.5 mile of eelgrass beds.

All of the Alternatives would potentially result in direct impacts on ESA listed species and/or the habitats on which they depend – Alternatives 1, 2, or 3 would require construction of 2 to 3-mile long bridge across Skagit Bay, which is an important habitat for several federally listed fish and wildlife species including bald eagle, chinook salmon, bull trout, and marbled murrelet. Alternative 4 would require construction and operation of ferry terminals in this same area. As a result, potential impacts on listed species and their habitats would need to be reviewed for compliance with Section 7 of the ESA.

Section 7 requires federal agencies to ensure that their actions do not jeopardize endangered or threatened species or their critical habitats. Federal actions include providing funding or issuing various types of approvals for a project. When a listed species is known to occur in the project vicinity, the lead agency, or its designee, must complete a biological assessment (BA) describing how the project would affect the species. If the assessment determines that a listed species or critical habitat is likely to be adversely affected by the project, the agency must enter formal consultation with the FWS and NMFS.

During formal consultation, NMFS and FWS will work with the project proponent to identify reasonable and prudent measures to minimize the impact of "incidental take" that might otherwise result from the project. Under ESA a "take" is to harrass, harm, hunt, wound, shoot, kill, trap, capture, or collect a listed species. An "incidental take" is any take that is "incidental to, and not the purpose of, the carrying out of an otherwise lawful activity."

The reasonable and prudent measures and their implementing conditions provide an exception for the specified levels of incidental take and are binding conditions of a grant or permit issued to the applicant. If no reasonable and prudent conditions are identified and the FWS and NMFS determine that the existence of a listed species existence is jeopardized or adverse modification of critical habitat would occur then incidental take would not be permissible.

PERMITTING AND MITIGATION ISSUES

PERMITTING

All of the alternatives are likely to face significant challenges during permitting and environmental review because of the magnitude and nature of the potential impacts. Proposals to develop new road access and bridge or causeway crossings from the mainland to Whidbey Island would obviously be scrutinized intensely for their impacts on adult and juvenile chinook migration, juvenile salmon foraging activities, and other species/reosources. With any of the proposed alternatives, loss of wetland and intertidal habitat could be on the order of tens of acres (assuming construction of a 2+ mile-long bridge across Skagit Bay and individual freshwater wetland fills). Other projects that have proposed wetland fills of this magnitude have been subject to intense scrutiny from regulatory agencies and affected tribes and been very difficult to permit. These difficulties typically involve scheduling delays, difficulty in finding and implementing adequate mitigation (see below) and significant costs associated with ongoing project coordination and analysis.

In addition to the ESA review described above, a detailed evaluation of the impacts would be required in accordance with NEPA and SEPA. Other permits/approvals that would likely be required for any/all of the alternatives include:

- Individual Section 404/401 Clean Water Act permit - for filling wetlands/ Waters of the US
- Section 10 Rivers and Harbors Act – for crossing navigable waters
- Hydraulic Project Approval – for working within the bed or banks of a river, stream, or marine waterbody
- Shoreline Substantial Development Permit – for modification of shorelines of the state
- Aquatic Lands Lease – for crossing tidelands under the jurisdiction of the Washington Department of Natural Resources
- Skagit County Sensitive Areas Ordinance review – for projects affecting designated sensitive areas such as Skagit Bay

MITIGATION

Regulatory agencies require that mitigation include the following steps in sequence:

1. *avoid* impacts by not taking an action;
2. *minimize* impacts by reducing the size or scale of an action;
3. *rectify* impacts by restoring the affected environment; and
4. *compensate* for impacts by replacing, enhancing, or substituting resources.

Impact avoidance, minimization, and rectification measures that would likely be required for this project include, but not be limited to:

- Observing appropriate construction windows for bald eagles– The Bald Eagle Recovery Plan (USFWS 1986) requires that construction activities within 0.25 mile of a bald eagle nest be conducted outside of the breeding period. Construction may occur within 0.5 mile of bald eagle nests during breeding season if the nest is blocked from line-of-sight by vegetation and/or topography. The breeding period for bald eagles is between January 1 and August 15. Bald eagles are currently being considered for removal from the Endangered Species List.
- Observing appropriate construction windows for fish - Typically, the waters of Puget Sound are closed to construction projects from March 14 to June 15 as specified in Hydraulic Permit Approval issued by the WDFW. Additional restrictions can be expected in areas where sand lance and surf smelt spawn.
- Implementing Best Management Practices (BMPs) to minimize construction impacts and manage storm water runoff during project operation.
- Providing storm water treatment for pre-project conditions (retrofitting).
- Designing the road/bridge improvements to have the smallest "footprint" practicable (i.e., using retaining walls instead of fill slopes.
- Designing ferry docks to minimize shade impacts.

In addition to these measures, unavoidable impacts will require compensatory mitigation to offset habitat losses. Compensation would generally involve creation, restoration or enhancement of sensitive habitats to achieve no net loss of area or function. Compensation generally must occur at a ratio of between 1:1 and 6:1 (area lost:area replaced). This would mean creating, restoring, and/or enhancing large areas of freshwater wetland and intertidal habitat to offset impacts of filling and shading. This could potentially be achieved by breaching or removing dikes on agricultural lands in the Skagit estuary. Additional investigation would be needed to evaluate the effectiveness of this type of mitigation in terms of offsetting the functional impacts of the project.

Tribal and WDFW technical staff are developing a recovery plan for Puget Sound chinook that deals specifically with harvest management and hatchery production issues in light of the recent threatened listing. Restoration and protection of essential habitat in the Skagit and Snohomish River systems is essential to the recovery of the ESU, because of their high natural production potential. Prior and ongoing fisheries research in the Skagit system points to factors in the freshwater and estuarine areas that limit chinook production. Restoration planning has focused on re-opening and improving juvenile rearing areas in the Skagit delta and estuary as achievable means to improve chinook production. Mitigation activities would most likely need to be coordinated with recovery planning efforts.

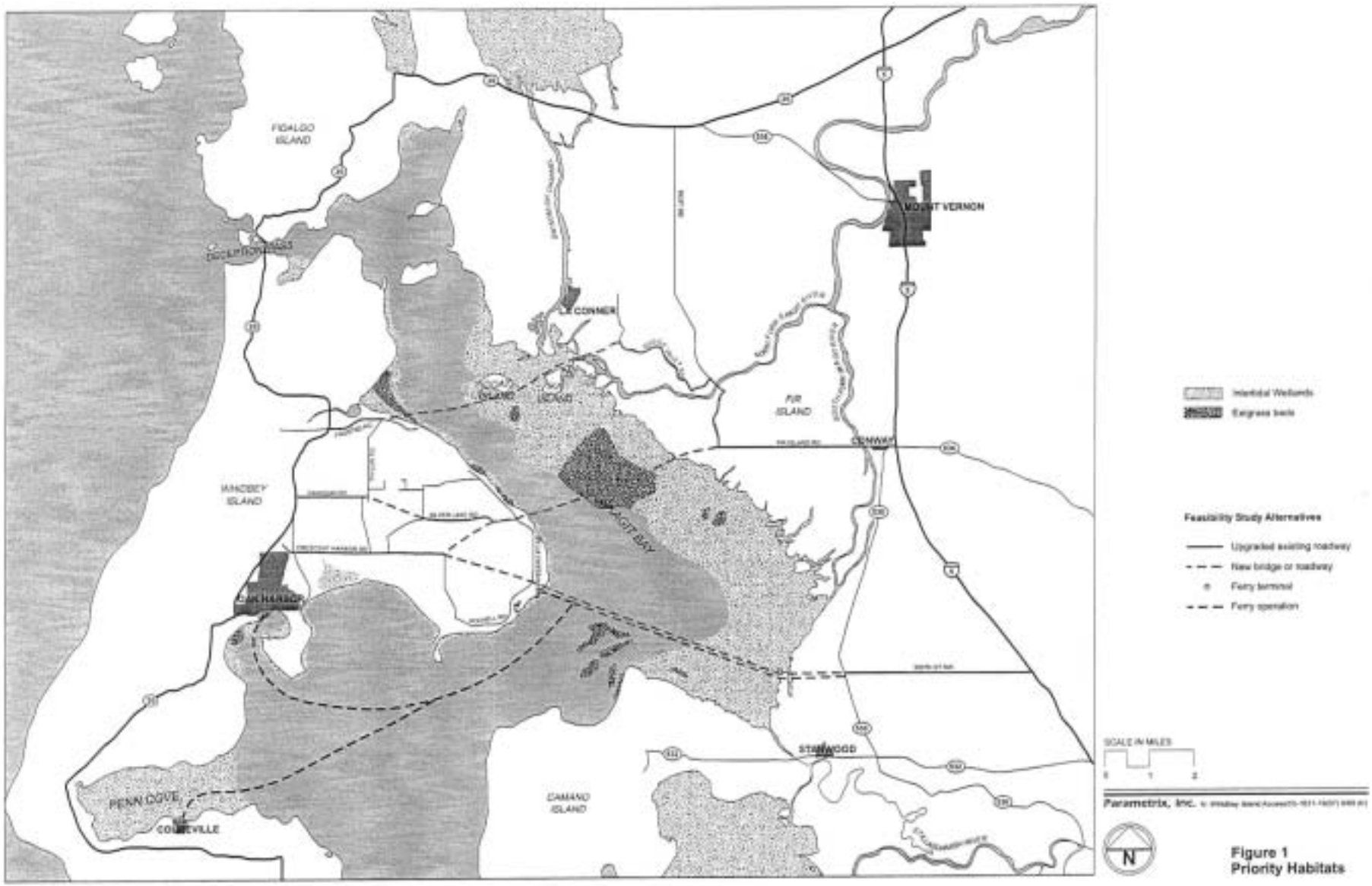
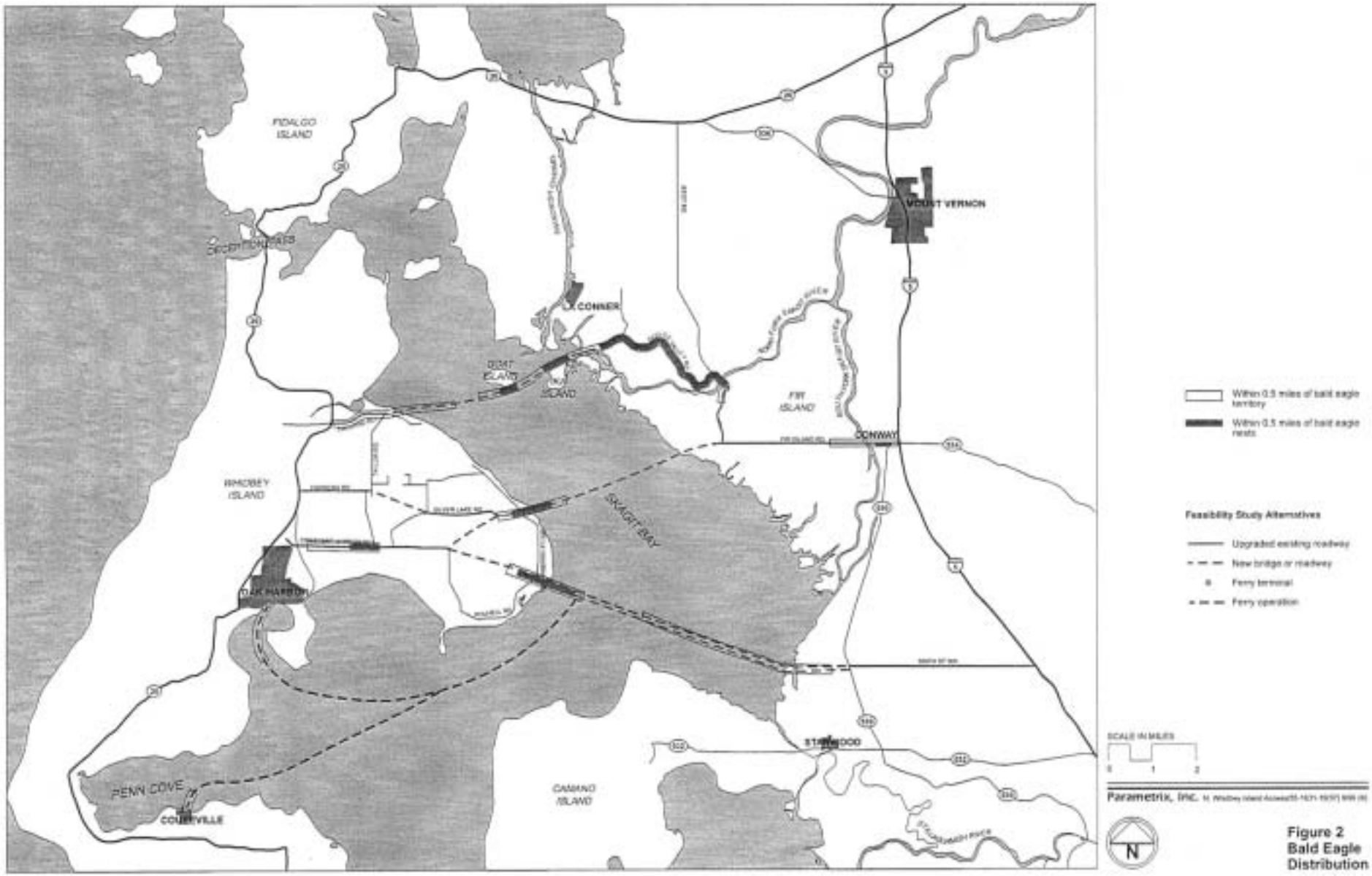


Figure 1
Priority Habitats



Parametrix, INC.

Figure 2
Bald Eagle Distribution

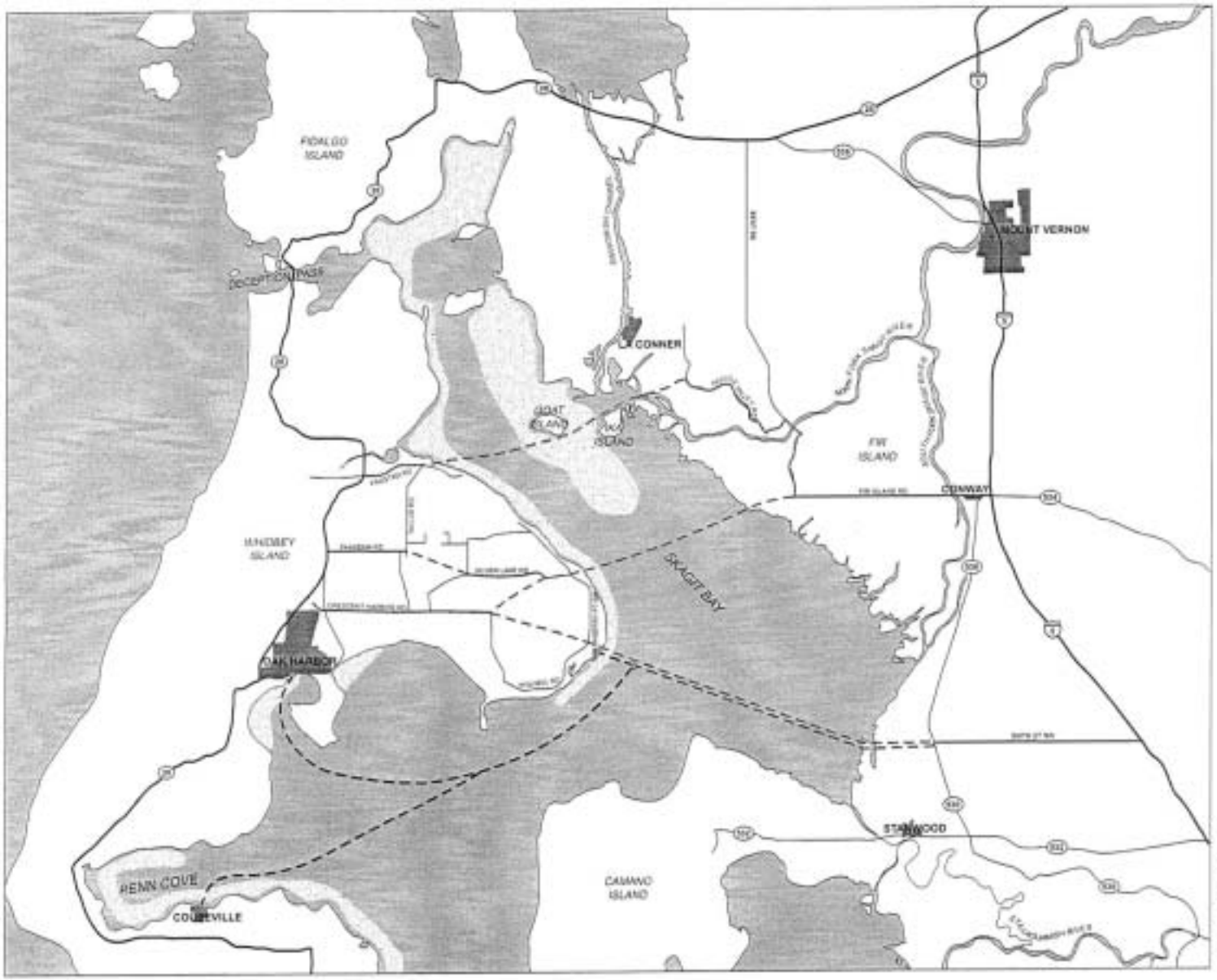


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Figure 3
Fish Spawning Distribution

North Whidbey Island Access Feasibility Study
Environmental Issues - Floodplain Review

Introduction

Based on a review of floodplain mapping prepared by Federal Emergency Management Agency (FEMA) for Island, Skagit and Snohomish Counties, each of the alignment alternatives under consideration would traverse areas within the 100-year floodplain of the area. A large portion of this floodplain is incorporated into the tidal impacted areas of Puget Sound, which includes the outer delta reach of the Skagit River. Other major floodplain areas are partially protected by a dike system that has been developed to protect local communities and create land suitable for agriculture.

General Impacts

Those portions of all alignments that cross the active tide flats of Puget Sound are considered unsuitable for construction of roadway embankments. Alignment development in the tidal areas has been scoped to utilize bridge structures in an effort to minimize negative impacts to the sensitive ecological regimen that exists.

Adjacent to large sections of the active tidal areas the alignments traverse lands that have been claimed for agriculture by construction of dikes that hold back the tidal action, and in many places, the annual flood action of the Skagit River. For this study, alignments that traverse reclaimed land are considered acceptable for construction of earth fill embankments. This condition can be noted on all three of the roadway alternatives considered in this study and in each county affected.

Skagit River Impacts

Most of Alignment 1 and Alignment 2 within Skagit County lie within the 100-year floodplain, with minor sections near Dodge Valley Road outside of flood risk. All of the alignment along Fir Island Road lies within the 100-year floodplain, including the interchange at I-5. Fir Island and other surrounding land is presently protected from flooding by an extensive dike system. Recent history has shown that these dikes are subject to being breached during extreme high water flows in the Skagit River.

Design choices, in the areas impacted by the annual high runoff of the Skagit River, include construction of the roadway below flood elevations, with the risk of flooding that could temporarily close the roadway; or providing for an elevated roadway above the 100-year flood level. To create an elevated roadway the design would need to include the capability to pass the flood waters through the roadway alignment to not function as a dike that would block the flooding river. To accomplish this degree of protection could result in the need for a trestle-type bridge structure along most of Fir Island Road. Cost estimates for this level of protection are not reflected within this study analysis.

October 20, 1999
HWA Project No. 98175

Parametrix, Inc.
5808 Lake Washington Blvd., N.E., Suite 200
Kirkland, WA 98033-7350

Attention: Katherine Casseday

Subject: **GEOTECHNICAL FEASIBILITY AND CONCEPT STUDY**
SR 20, North Whidbey Island Access Feasibility Study (NWIAFS)
Snohomish, Skagit and Island Counties, Washington

Dear Ms. Casseday:

This letter report presents our findings and conclusions regarding the alternative routes being considered for improved access to North Whidbey Island. These findings and conclusions are based on geotechnical information disclosed during our literature search, field reconnaissance and knowledge of the project area.

Scope of Work

For this study we considered four possible corridors or routes for increased vehicle access to the North Whidbey Island area. These four alternatives were selected by the NWIAFS Technical Steering Committee using screening criteria and are discussed in the meeting summary prepared by WSDOT, dated March 11, 1999. The four alternatives included:

1. New bridge from North Whidbey Island to vicinity south of La Conner
2. New bridge from Strawberry Point area to Fir Island/Conway area
3. New bridge from Strawberry Point area to 300th St. NW vicinity
4. New ferry service from North Whidbey Island to 300th St. NW vicinity

For each of these alternatives, we searched for existing geotechnical information in the general vicinities and performed a site reconnaissance. The WSDOT geotechnical archives in Tumwater were visited and yielded some information in the Stanwood vicinity. The remainder of our information was drawn from geologic maps of the areas, specifically the *Suficial Geology Map of the Port Townsend 30- by 60-Minute Quadrangle, Puget Sound Region, Washington*, Pessl et al., 1998, and *Seismotectonic Map of the Puget Sound Region, Washington,* USGS, MAP-I-1613, Gower et al., 1985. An excerpted portion of the Pessl et al. map is attached as Figure 1. The alignments and corridors studied are indicated on the map.

Each of the alternates is discussed separately, below. For brevity, the soil and geologic conditions are discussed more thoroughly for the first option and more briefly for the remaining options.

Option 1 - New Bridge from North Whidbey Island to Vicinity South of La Conner

From west to east, this alignment would begin at SR 20 almost due east of Ault Field. The alignment would cross the uplands of Whidbey Island from SR 20 to the bluffs above Skagit Bay. In general, the alignment would be built upon soils of glacial origin, that may or may not be glacially overridden. There are moderate risks of liquefiable soil deposits and soft/loose soils. Once the alignment reaches the bluffs above Skagit Bay, landslide terrain is highly likely to be encountered. Mapped landslide deposits are present near the alignment landfall in this area.

It is assumed that, from the bluffs, the alignment would proceed as a high, elevated structure for vessel clearance for some distance east. Before reaching mean higher high water on the mainland side, the bridge structure will need to cross approximately 3 miles of tide flat, marsh, bog or swamp deposits. The tide flat deposits are mapped to the extent that they occur above mean lower low water. The tide flat deposits are also indicated to "locally support sparse vegetation dominated by eel grass." Should the structure find landfall on either Goat or Ika Island, bedrock of an undetermined type would likely be encountered. Structure foundations would likely consist of driven piling or large diameter shafts. Caissons are possible for support of tall columns with long span sections. Total bridge length would be on the order of 4½ to 5 miles.

From the landfall, the new alignment would extend north and/or southeast to connections with existing roads. To the north, these alignments would be constructed on younger alluvium deposits of Holocene age. These deposits are likely to be soft and/or loose and may be subject to settlement under embankment loading, or liquefaction during an earthquake. To the south, the route may encounter bedrock or Vashon Till that comprises the higher elevations of Pleasant Ridge. Vashon Till is a glacially consolidated unit that is generally not prone to settlement or liquefaction risks. Landslide risks in the till are present only when exposed in steep slopes such as those commonly viewed from the waters of Puget Sound. Dodge Valley is filled with younger alluvium of similar properties as those to the north.

The east end of the Option 1 route intersects a mapped inferred fault near La Conner. This feature corresponds with a high amplitude magnetic anomaly, and is considered the westward extension of the Devils Mountain Fault, separating highly magnetic ophiolite on the north from weakly magnetic metamorphic rock to the south. No geologic units

younger than Oligocene (24-37 million years ago) are definitely known to have been offset by the Devils Mountain Fault.

Option 2 - New Bridge from Strawberry Point Area to Fir Island/Conway Area

Most of the alignment from SR 20 to Strawberry Point will cross Vashon Till. As the alignment approaches the bluffs, the risks of slope instability increase, but less so than for Option 1, where known landslides exist. The bluffs are higher from Strawberry Point than for Option 1, thus requiring either a higher bridge structure or a through-cut transverse to the bluff to lower the grade.

Over-water structure options are similar to those for Option 1. The length of structure crossing the tide flat deposits is about 2 miles for this option. The total bridge length would be on the order of 4 miles. The impacts for improving the roads from the landfall area to the Conway vicinity are thought to be relatively minor. These impacts may include settlement of new fills on the younger alluvium present in this area. If capacity improvements to the Skagit River Bridge are required, the potential for liquefaction should be considered.

Option 3 - New Bridge from Strawberry Point Area to 300th St. NW Vicinity.

The alignment from SR 20 to Strawberry Point would encounter similar conditions to Option 2. Bridge issues are also similar to Option 2, with the tide flat crossing also about 2 miles in length. The total bridge length would be on the order of 6 miles. The connections and/or improvements to 300th St. NW are not likely to encounter soil or geologic conditions that present high risk or cost factors.

The Option 3 alignment intersects a mapped fault near Strawberry Point. This feature corresponds with a sharp east-trending gravity anomaly bounding the north side of a large gravity low to the southeast, and coincides with linear alignment of a series of small magnetic lows that may be related to the inferred fault zone. This feature is considered the westward and eastward continuation of the Northern Whidbey Island Fault. Faulting of sediments deposited prior to the Fraser Glaciation occurs along strike of the structure. Overlying Fraser glacial deposits are apparently not deformed along this structure.

Option 4 - New Ferry Service from North Whidbey Island to 300th St. NW Vicinity

Ferry terminal construction would likely include pile driving for support of the dock, towers, transfer span, wingwalls and dolphins. Pile driving may be difficult on the Whidbey Island side due to dense soil conditions. Pile depths may be deep (100 feet or more) on the mainland side due to the distance out over the tide flats which the bridge or

trestle must be constructed in order to reach navigable water depth. The bridge issues over the tide flats would be essentially the same as for the other options. The length of bridge over the tide flats would be about 2 miles. The connections to I-5 would be similar to Option 3.

Conclusions

All of the discussions above are based on an assumption that the tide flat deposits would be bridged with an elevated structure. The distance of tide flat crossing is relatively long for all of the alignments studied. While it may be feasible to design fill-over-soft-ground sections for these crossings, it is felt that long term performance of such fills would be questionable. Differential settlements could be problematic to long term maintenance.

There is the potential for environmental impacts that are due to the soil and geotechnical conditions, but the impacts are not soils, geology or groundwater related. We are terming these impacts geo-environmental impacts and would include issues such as the visual impact related to the soils dictating structural passage over the tide flats.

From a geotechnical and geo-environmental standpoint, Option 4 probably represents the alignment with the lowest relative geotechnical risk and impact. Option 2 probably represents the bridge option with the lowest relative geotechnical risk and geo-environmental impact. The following table summarizes, in a relative way, our opinions of the issues and impacts.

Option	Landslide Hazards	Settlement/ Liquefaction Hazards	Geo-environmental challenges	Foundation Costs
1	**High**	**High**	**Very High**	**High**
2	**Moderate**	**Moderate to High**	**High**	**High**
3	**Moderate**	**Moderate to High**	**Very High**	**High**
4	**Low**	**Moderate**	**Very High**	**Moderate to High**

Sincerely,

HWA GeoSciences Inc.

Ralph N. Boirum, P.E.
Vice President

SR 20 North Whidbey Island Access Feasibility Study
Transportation Performance Analysis

Introduction and Background

The Washington State Department of Transportation (WSDOT) identified a vehicle capacity deficiency on the SR 20 corridor and Deception Pass/Canoe Pass bridges linking Fidalgo Island, Skagit County and north Whidbey Island, Island County. The North Whidbey Island Access Feasibility Study is being conducted to evaluate four proposed routes across Skagit Bay that would link SR 20 on north Whidbey Island to Interstate 5. To evaluate the alternatives, various Measures of Feasibility (MOF) were developed in cooperation with the project Policy and Technical Steering Committees that take into consideration social impacts, land use/economic development impacts, financial/economic performance, environmental impacts, and transportation performance.

Three MOF were developed to evaluate transportation performance of the alternatives: TP1 Travel time from Oak Harbor to Mount Vernon, TP2 Travel time from Oak Harbor to Everett and TP3 Level of Service on Key Roadways. These transportation performance measures of the four alternatives in the North Whidbey Island area were identified by the project Technical Advisory Committee as travel time and level of service. For the alternatives to be considered feasible, from a transportation performance perspective, there needs to be some benefit to the transportation system. This technical memorandum included the estimated ***travel time savings*** associated with each access alternative for North Whidbey Island. A summary of roadway level of service for each alternative is also presented below, with focus specifically on the expected operation on SR 20 at the Deception Pass/Canoe Pass Bridges.

Methods

Forecasts for year 2020 were provided for the study area by WSDOT staff. The Whidbey Island Regional Model, or WIRM, was developed by WSDOT staff using Tmodel2 software in conjunction with Skagit Council of Governments and Island Sub-Regional Transportation Planning Organization. Output from the modeling effort for each of the alternatives was used to measure the expected travel time savings. Traffic assignments for the bridge alternatives with toll value in place have been used to assess the potential changes in roadway level of service with each alternative. Any new facility is envisioned to be a toll facility, based on the current availability of funding, and vehicle toll values were estimated at $3.50 and $5.00 per vehicle for each direction for the purpose of this analysis. Travel forecasts for the new bridge connections and roadways throughout the network reflect the range of toll values, $3.50 -$5.00 in the PM peak hour.

Future travel time between a few key locations is some measure of the benefit possible from the new connections. Travel time values between Oak Harbor and Anacortes, Mount Vernon and Everett were chosen by the study Technical Committee to be the important measures for the purposes of this feasibility analysis.

Findings

Travel Time Savings

A comparison of future year 2020 travel time for each alternative with the No Build scenario results in an estimate of travel time savings that could be attained during peak period travel under the no-toll scenario. This reflects a time savings per trip during the PM peak hour, which is most likely to be the most dramatic period for time savings potential. The table below (TP-1) presents the estimated travel time savings between three key location pairs in the study area, Oak Harbor to Mount Vernon, Oak Harbor to Everett and Oak Harbor to Anacortes, comparing model output travel times for the new connection alternative and the future No Build condition.

Table TP-1
System Average Travel Times and Savings
Year 2020 No Build and No Toll Scenarios

Alternative	Oak Harbor to Mount Vernon		Oak Harbor to Everett		Oak Harbor to Anacortes	
	Average for all routes, Zone 18 to 300, in minutes	Travel Time Savings, in minutes	Zone 18 to 65, in minutes	Travel Time Savings, in minutes	Zone 18 to 332, in minutes	Travel Time Savings, in minutes
No Build	90	n/a	238	n/a	72	n/a
North Bridge	79	11	199	39	63	9
Middle Bridge						
Fakkema Road connection	75	15	172	66	61	11
Crescent Harbor Road connection	74	16	191	47	62	10
South Bridge	75	15	160	78	62	10
Ferry to Strawberry Point	85	5	215	23	67	5
Ferry to Oak Harbor	85	5	276	-38	67	5
Ferry to Coupeville	90	0	247	-9	68	4

In addition to the travel time savings expected for the system as a whole, the model output has identified some specific areas where travel time would be significantly reduced. Table TP-2 shows the forecasted travel times *by route* for the year 2020 under the no-toll conditions, with the

highest traffic assigned to the new bridge facilities, and this provides a best-case view of travel time savings for the existing routes.

Table TP-2
Estimated Travel Time Savings by Route
Year 2020 No Toll Scenario

Alternative	Oak Harbor to Mount Vernon		Oak Harbor to Everett		Oak Harbor to Anacortes
	via Deception Pass	via new bridge	via Deception Pass	via new bridge	via Deception Pass
	(minutes)	(minutes)	(minutes)	(minutes)	(minutes)
Bridge to La Conner Vicinity	16	none, longer trip	37	73	11
Bridge to Fir Island and Conway					
Fakkema Road connection	21	none, longer trip	36	59	16
Crescent Harbor Road connection	23	none, longer trip	40	47	17
Bridge to north Stanwood Vicinity	22	none, longer trip	44	71	16

Level of Service

Roadway level of service was evaluated using the model link capacity for key roadway sections along with the traffic assignments for three possible future scenarios: 1) no tolls on the bridge facilities, 2) low value tolls per trip of $3.50 in 1999 dollars, and 3) high value tolls per trip of $5.00 in 1999 dollars. The traffic assignments are shown in attached figures for the no toll, low toll and high toll scenarios along with the volume to capacity ratios and level of service for the three toll value scenarios. Range values for level of service are as follows:

Table TP-3
Ranges of Level of Service

Volume to Capacity (V/C) Ratio	Level of Service (LOS)
0 – 0.30	A
0.31 – 0.50	B
0.51 – 0.70	C
0.71 – 0.85	D
0.86 – 1.0	E, capacity
> 1.0	F, over capacity, breakdown flow

Table TP-4
Forecasted 2020 PM Peak Level of Service for Key Roadways

Alternative	SR 20 at Deception/Canoe Pass Bridges			New Facility		
	No Toll	Low Toll, $3.50 per trip	High Toll, $5.00 per trip	No Toll	Low Toll, $3.50 per trip	High Toll, $5.00 per trip
No Build	F	F	F	n/a	n/a	n/a
Bridge to La Conner vicinity	C	F	F	E	B	A
Bridge to Fir Island	C	F	F	E	B	B
Bridge to north Stanwood vicinity	C	C	E	E	D	C
Ferry from north Stanwood vicinity	F	F	F	E, at capacity	E, at capacity	E, at capacity

Under the no toll traffic assignment, each bridge alternative would operate at LOS E or near capacity and SR 20 at the Deception Pass Bridge would operate near LOS C. Although the model output indicates a difference between the future operation of the facilities, it is reasonable to expect more of an equilibrium of operation between SR 20 and a new bridge. With tolls on the bridges ($3.50 to $5.00 per trip), traffic assignment would be reduced on the new bridges and thus reducing the effectiveness of relief for SR 20 at the Deception Pass Bridge.

Under any toll traffic assignment, there would be LOS F operation on SR 20 at the Deception Pass Bridge with either the La Conner vicinity bridge or the Fir Island bridge alternatives. With the north Stanwood vicinity bridge alternative, SR 20 at Deception Pass Bridge would operate at LOS C under low toll operation and LOS E under the high toll operation.

Future operation along SR 20 in Skagit County would continue in the LOS C-D range regardless of toll scenario. Traffic operation along I-5 would continue to be congested at LOS E/F regardless of alternative or toll scenario considered. Under either toll scenario, connections from the bridge alternatives to existing roadways could result in some degradation of level of service, to LOS D on Whidbey Island (Crescent Harbor Road) and to LOS E in Skagit County (Dodge Valley Road, Best/Chilberg Road and Fir Island Road).

Summary

For future peak period travel **between Oak Harbor and Mount Vernon**:

- Travel time improvements would be felt along the existing SR 20 corridor under each of the bridge alternatives by 16 to 23 minutes per trip during the PM peak and up to 5 minutes for ferry options.
- Travel using a new bridge may be longer, however the average travel time *for the system* would decrease by 11 to 15 minutes during the PM peak.

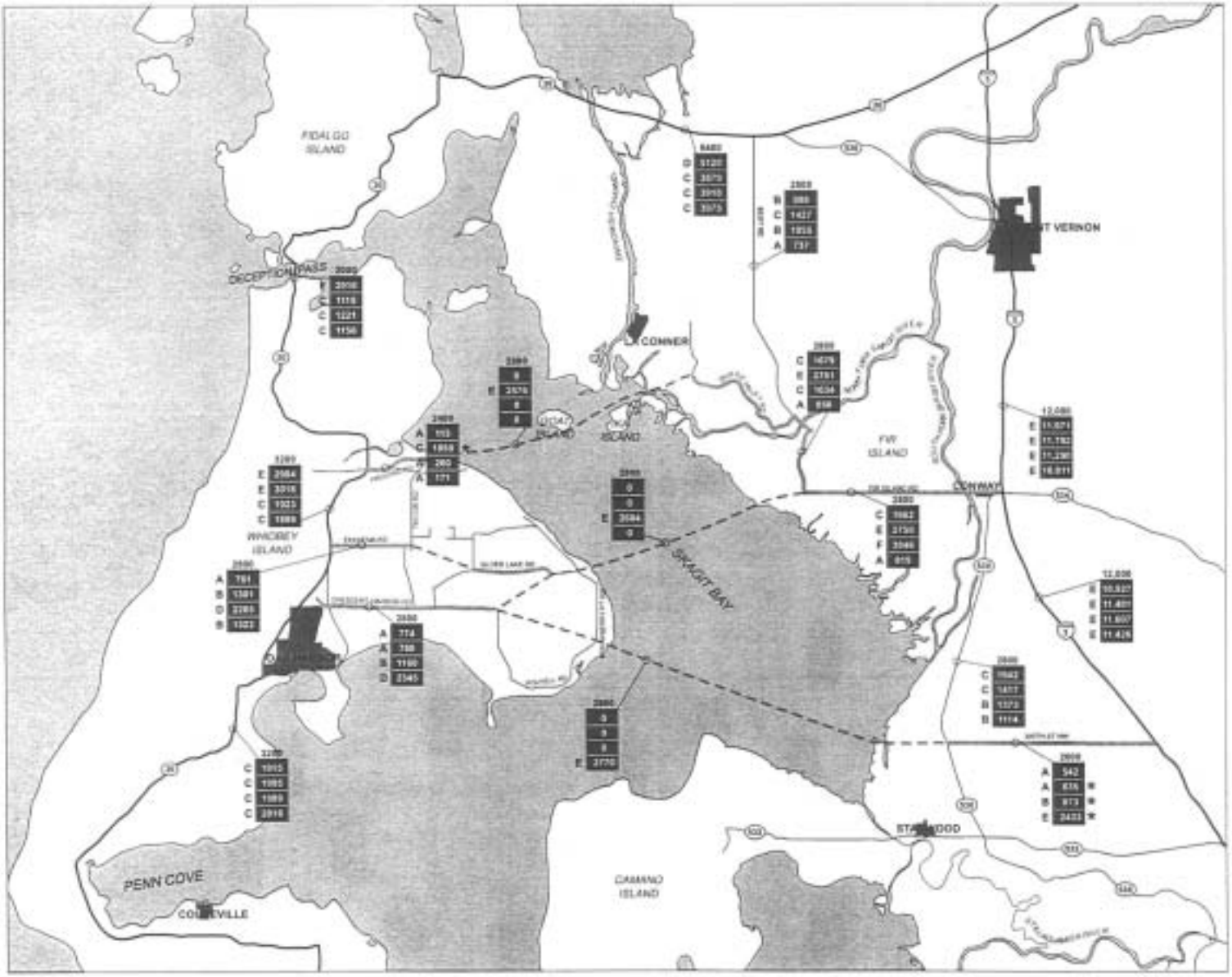
For future peak period travel **between Oak Harbor and Everett**:

- Travel time improvements would be felt along the existing SR 20 corridor under each of the bridge alternatives by 36 to 44 minutes per trip during the PM peak.
- Travel time savings along the new bridge alternatives could result in 47 to 73 minutes saved per trip during the PM peak.
- Average travel time for the system would decrease by 39 to 78 minutes for the bridge alternatives.
- The two ferry runs (to Strawberry Point and to Oak Harbor) could provide 5 minute time savings over the No Build condition.
- The longer ferry run to Coupeville would maintain the same travel time as the No Build condition.

For future peak period travel **between Oak Harbor and Anacortes**:

- All travel between Oak Harbor and Anacortes would experience some travel time savings with bridge or ferry alternatives.
- Travel time savings along the existing SR 20 route would range from 11 to 17 minutes per trip for the bridge alternatives.
- The ferry alternative routes would result in 4-5 minute travel time savings.

Roadway level of service would improve to LOS C on SR 20 at Deception Pass/Canoe Pass Bridges for each bridge alternative under the no-toll traffic assignment scenario. With implementation of any toll on the bridges, only the north Stanwood bridge alternative would improve the Deception Pass Bridge peak hour level of service, to LOS D or LOS E in the year 2020 traffic conditions forecasted.



Year 2020 PM PK Hour Traffic Volumes

LOS	XXXX
A	Roadway Capacity
B	No Build
C	North Bridge: La Conner Vicinity
D	Middle Bridge: Fir Island to Conway
	South Bridge: Stanwood Vicinity

Volume to Capacity & LOS Relationship

V/C	LOS
0-0.30	A
0.31-0.50	B
0.51-0.70	C
0.71-0.85	D
0.86-1.0	E
>1.0	F

Feasibility Study Alternatives

- Upgrade existing roadway
- New bridge or roadway
- ★ Upgrade to 2,800 capacity

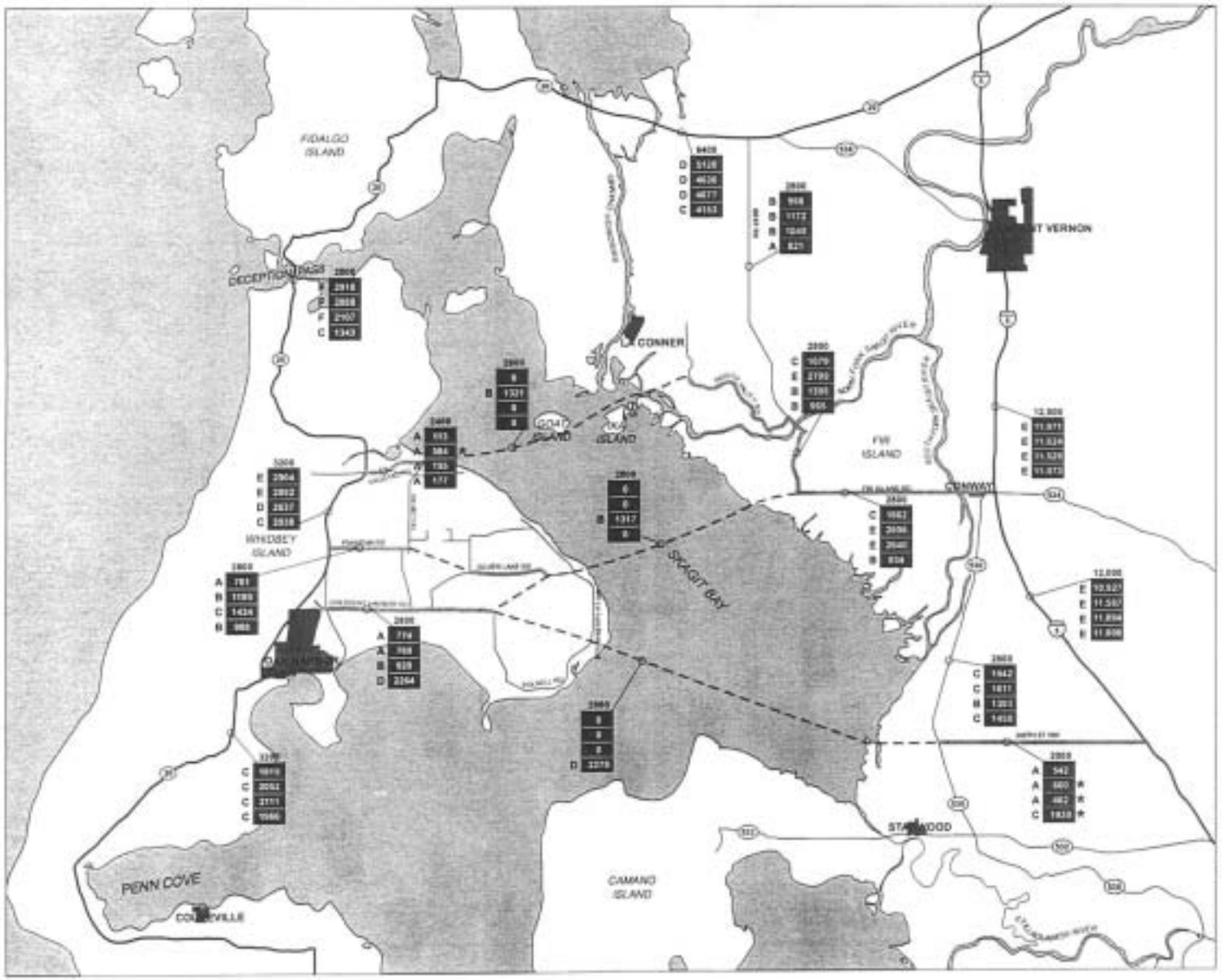
SCALE IN MILES

0 1 2

N

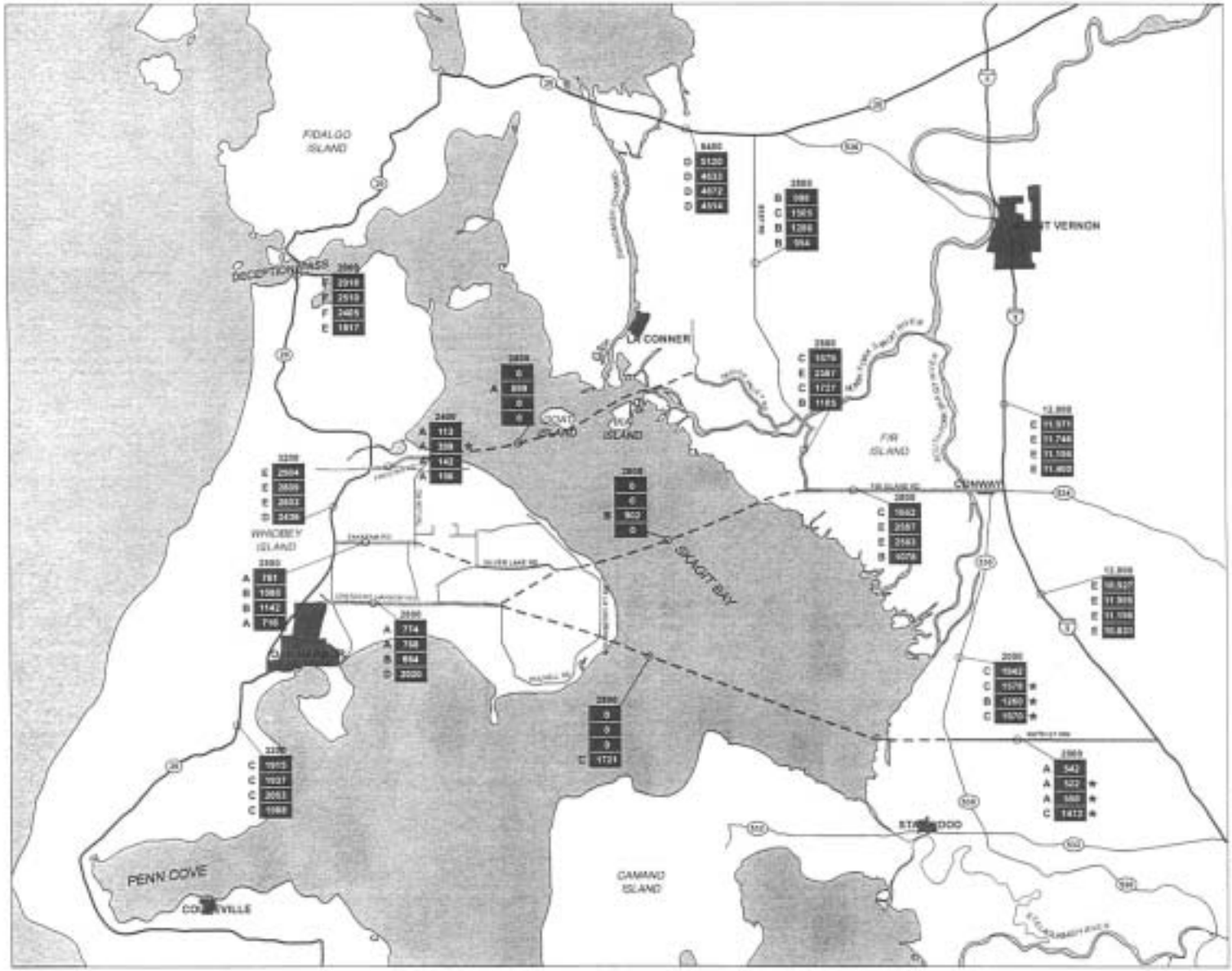
Parametrix, Inc.

Figure TP-1
Year 2020 Peak Traffic Volumes & LOS Bridge Alternatives– No Toll



Parametrix, Inc.

Figure TP-2
Year 2020 Peak Traffic Volumes & LOS Bridge Alternatives–Low Toll Value



Year 2020 PM PK Hour Traffic Volumes

LOS	XXXX
A	XXXX No Build
B	XXXX North Bridge: La Conner Vicinity
C	XXXX Middle Bridge: Fir Island to Conway
D	XXXX South Bridge: Stanwood Vicinity
	XXXX Roadway Capacity

Volume to Capacity & LOS Relationship

V/C	LOS
0-0.30	A
0.31-0.50	B
0.51-0.70	C
0.71-0.85	D
0.86-1.0	E
>1.0	F

Feasibility Study Alternatives

- Upgrade existing roadway
- New bridge or roadway
- ★ Upgrade to 2,000 capacity

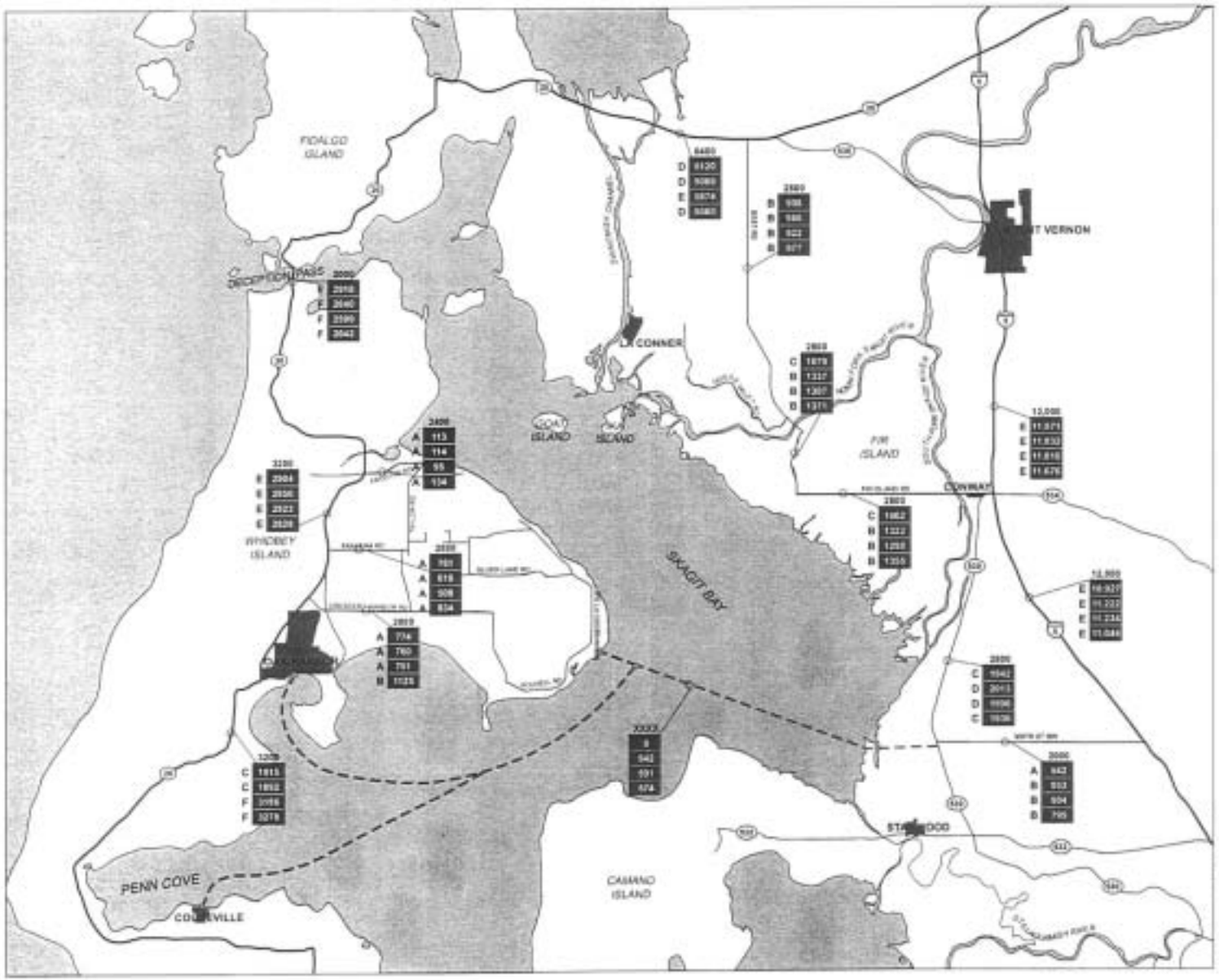
SCALE IN MILES

0 1 2

Parametrix, Inc.

N

Figure TP-3
Year 2020 Peak Traffic Volumes & LOS
Bridge Alternatives–
High Toll Value



Year 2020 PM PK Hour Traffic Volumes

LOS	XXXX	
A	XXXX	Roadway Capacity
B	XXXX	No Build
C	XXXX	Ferry to Coupeville
D	XXXX	Ferry to Oak Harbor
		Ferry to Strawberry Pt.

Volume to Capacity & LOS Relationship

V/C	LOS
0-0.30	A
0.31-0.50	B
0.51-0.70	C
0.71-0.85	D
0.86-1.0	E
>1.0	F

Feasibility Study Alternatives

- Ferry terminal
- Ferry operation
- New dock or roadway

SCALE IN MILES

0 1 2

Parametrix, Inc.

N

Figure TP-4
Year 2020 Peak Traffic Volumes & LOS–Ferry Alternatives

APPENDIX C
Alternative Summaries

SUMMARY OF FEASIBILITY MEASURES

Bridge from North Whidbey Island to Vicinity of LaConner

DESCRIPTION OF ROUTE

Roadway improvements would extend from SR 20 along Frostad Road to Dugualla Bay, a 4.8 mile bridge would cross Skagit Bay between Goat and Ika Islands and land near the north edge of the North Fork Skagit River delta. The route then continues along Dodge Valley Road, Best/Chilberg Road, crosses the North Fork Skagit River south to Fir Island Road, following Fir Island Road through Conway to I-5.

SOCIAL IMPACTS

- Approximately 42 hunter-fisher-gatherer and historic period archaeological sites are located within the 0.5 mile of the alignment, 35 would require evaluation.
- Six inventoried historic buildings and building complexes would require evaluation for significance.
- Approximately 367 residences lie within 0.5 mile of the alignment; 185 on Whidbey Island, and 182 in Skagit County. An estimated 52 residences and 7 businesses lie within the proposed 200' right-of-way required for the project.
- Existing roadways would be upgraded to major arterial classification with a 50 mph speed limit including Frostad Road on Whidbey Island, and Dodge Valley Road, Best/Chilberg Road, and Fir Island Road in Skagit County.
- Side street intersections would be primarily stop controlled and access to the new facility would be maintained comparable to existing. Signals would likely be needed at SR20, Best/Chillberg Road, in Conway, and at the I-5 interchange. Limited access would be required near the toll plaza facility, with minor rerouting of traffic.

ENVIRONMENTAL IMPACTS

Significant impacts are expected with this alternative on Federally listed threatened and endangered species as follows:

- Two crossings of the North and South Forks of the Skagit River with known large populations of threatened chinook, proposed threatened bull trout, and candidate coho salmon would result from this alignment.
- Eleven bald eagle nests in four bald eagle territories are within 0.5 mile of the alignment.
- Three and one-half mile of estuarine intertidal habitat along the east side of Skagit Bay and in Dugualla Bay would be potentially affected by bridge development. These areas are recognized as important wintering and staging habitat for waterfowl, as rearing habitat for

threatened chinook salmon, and as breeding/rearing habitat for herring, sand lance, and smelt.

- Of the 3.5 mile length of bridge in the intertidal area, approximately 0.2 mile length through eelgrass habitat, an important habitat critical for supporting several priority fish species and other marine life. Eelgrass beds are considered to be irreplaceable and avoidance is the recommended mitigation.

These impacts would present serious obstacles for obtaining approval by the US Fish and Wildlife Service and National Marine Fisheries Service.

- At least 20 emergent, shrub-scrub, and forested wetlands located on Fir Island are potentially affected. Several riparian wetland habitats along the rivers and streams could be affected. Adequate mitigation may be achieved through avoidance and minimization measures.
- All of the alignment along Fir Island Road lies within the 100-year floodplain, including the interchange at I-5. Portions of the alignment through Dodge Valley would be within the area of flood risk. Compensatory flood storage would need to be provided for all area lost due to the project.

LAND USE AND ECONOMIC DEVELOPMENT IMPACTS

- Approximately 73 acres of agricultural land would need to be acquired for right of ways. Three acres would be in Island County and 70 acres would be in Skagit County.
- Construction would occur in designated shoreline areas. The Shoreline Master Programs of Skagit and Island Counties stipulate that roadway construction shall be located away from shoreline areas whenever feasible.
- Bridge construction would result in substrate modification in existing eelgrass beds within Island County shoreline jurisdiction, which is ***prohibited*** under Island County Shoreline Use Requirements (Section 17.05.045).
- Construction would occur within Shorelines of Statewide Significance including the Skagit County marine shoreline, Whidbey Island marine shoreline and the North and South Forks of the Skagit River. Shorelines of Statewide Significance are given higher priority for protection and preservation than other designated shoreline areas.
- Approximately 23 farms and 13 businesses are within 0.5 mile of the alignment.
- Bridge would cross commercial and tribal crab and fish harvesting areas.
- Bridge construction in the Skagit River delta and estuary would potentially impact juvenile salmon rearing areas that support commercial and tribal fisheries.

FINANCIAL FEASIBILITY

- Planning Level Construction Cost Estimate: $321.1 million including roadways, bridge, right of ways, and traffic mitigation.

- Signal upgrades at the Conway interchange at I-5 are included in the conceptual cost estimate. Signalized control at SR 20 is included in the conceptual cost estimate. Other signalized intersections may include Best/Chilberg Road and SR 530.
- Operations and Maintenance costs for the project are estimated to be $1.360 million annually.
- Project level rate of return would range from –1.1% (negative return) to 1.4%, which would not be attractive to investors.

TRANSPORTATION PERFORMANCE

- An eleven-minute reduction in system average travel time is estimated between Oak Harbor and Mount Vernon compared with the future year 2020 No Action estimated travel time of 90 minutes.
- A nine-minute reduction in system average travel time is estimated between Oak Harbor and Anacortes compared with future year 2020 No Action estimated travel time of 72 minutes.
- A thirty-nine-minute reduction in system average travel time is estimated between Oak Harbor and Everett compared with future year 2020 No Action estimated travel time of 238 minutes.
- Travel time savings would be significant on SR 20 to Mount Vernon and to Anacortes from Oak Harbor, 16 and 11 minutes, respectively.
- Travel time savings would be significant between Oak Harbor and Everett either via SR 20 (37 minutes) or via the new bridge (73 minutes).
- Under a toll bridge operation, year 2020 PM peak hour operation on SR 20 at the Deception Pass Bridge would be LOS F, with LOSA-B on the new bridge.

SUMMARY OF FEASIBILITY MEASURES

Bridge from Strawberry Point on North Whidbey Island to Conway Area Via Fir Island

DESCRIPTION OF ROUTE

Roadway improvements would extend from SR 20 along Fakkema Road to Silver Lake Road, or from SR 20 along Crescent Harbor Road to Silver Lake Road, a 4.0 mile bridge crosses Skagit Bay from Strawberry Point to a landing at Fir Island Road, then crosses Fir Island to Conway at I-5.

SOCIAL IMPACTS

- Fifteen hunter-fisher-gatherer and historic period archaeological sites were identified within 0.5 mile of the proposed alignment, 14 of these would require evaluation.
- Two historic buildings would require evaluation for significance.
- A total of 767 residences occur within 0.5 mile of the Fakkema Road option and a total 1,246 occur along the Crescent Harbor Road option. Approximately 656 residences along are the Fakkema Road connection and 1,133 are along the Crescent Harbor Road option on Whidbey Island. Approximately 113 residences are within 0.5 mile of the alignment in Skagit County. An estimated 63 residences and 6 businesses lie along the Fakkema Road sub-alignment within the proposed 200' right-of-way required for the project, with 96 residences and 9 businesses along the comparable Crescent Harbor Road sub-alignment.
- Existing roadways along the alignment would be upgraded to major arterial classification with a 50 mph speed limit including Fakkema Road or Crescent Harbor Road, and Silver Lake Road.
- Side street intersections would be primarily stop controlled and access to the new facility would be maintained comparable to existing. Limited access would be required near the toll plaza facility, and require minor rerouting of traffic.

ENVIRONMENTAL IMPACTS

Significant impacts are expected with this alternative on Federally listed threatened and endangered species as follows:

- The South Fork of the Skagit River and one stream that support threatened chinook, proposed threatened bull trout, and candidate coho salmon populations would be crossed by this alignment.
- Up to 4 bald eagle nests in 2 bald eagle territories are with in the 0.5 mile of the alignment.
- Two and one-half mile of estuarine habitat in Skagit Bay would be potentially affected by the alignment. These areas are recognized as important wintering and staging habitat for waterfowl, rearing habitat for threatened chinook salmon, and as spawning/rearing habitat for herring, sand lance, and smelt.

- Of the 2.5 mile of estuarine habitat crossed by the bridge, approximately 1.5 miles are through eelgrass habitat; an important habitat critical for supporting several priority fish species and other marine life. Eelgrass beds are considered to be irreplaceable and avoidance is the recommended mitigation.

These impacts would present serious obstacles for obtaining approval by the US Fish and Wildlife Service and National Marine Fisheries Service.

- At least 16 forested, emergent, and scrub-shrub wetland areas and open water habitat would potentially be affected by the alignment. One of the emergent wetlands along the Crescent Harbor Road alignment is a large system (80+ acres) recognized by Washington Department of Fish & Wildlife as a State priority habitat. Adequate mitigation may be achieved through avoidance and minimization measures.
- All of the alignment along Fir Island Road lies within the 100-year floodplain, including the interchange at I-5. Compensatory flood storage would need to be provided for all area lost due to the project.

LAND USE AND ECONOMIC DEVELOPMENT IMPACTS

- Approximately 43 acres of agricultural land would need to be acquired for right of way in Skagit County. Approximately 10 acres would be needed for the right of way along the Fakkema Road option, and no agricultural land would be needed for the right of way along the Crescent Harbor Road option.
- Construction would occur in designated shoreline areas. The Shoreline Master Programs of Skagit and Island Counties stipulate that roadway construction shall be located away from shoreline areas whenever feasible.
- Shorelines of Statewide Significance that would be affected include Skagit Bay marine shoreline of Skagit County, the Skagit Bay marine shoreline of Whidbey Island, and the South Fork of the Skagit River in the project vicinity. Shorelines of Statewide Significance are given higher priority for protection and preservation than other designated shoreline areas.
- Approximately 18 farms and 12 businesses could be affected along the Fakkema Road option, or for the Crescent Harbor Road option 18 farms and 25 business could be affected.
- Bridge would cross commercial and tribal crab and fish harvesting areas.

FINANCIAL FEASIBILITY

- Planning Level Construction Cost Estimate: $183.4 million including roadway, bridge, right of ways, and traffic mitigation.
- Signal upgrades at the Conway interchange at I-5 are included in the conceptual cost estimate. Signalized control at SR 20 is included in the conceptual cost estimate. Other signalized intersections may be in Conway near SR 530.
- Operations and Maintenance costs for the project are estimated to be $1.098 million annually.

- Project level rate of return would range from 3.4% to 3.7%, which would not be attractive to investors.

TRAVEL TIME BENEFITS

- A fifteen-minute (or nine-minute) reduction in system average travel time is estimated between Oak Harbor and Mount Vernon via the Fakkema Road (or via the Crescent Harbor Road) option compared with future year 2020 No Action estimated travel time of 90 minutes.
- An eleven-minute (or eight-minute) reduction in system average travel time between Oak Harbor and Anacortes via the Fakkema Road (or via the Crescent Harbor Road) option compared with future year 2020 No Action estimated travel time of 72 minutes.
- A sixty-six-minute (or 49-minute) reduction in system average travel time between Oak Harbor and Everett via the Fakkema Road connection (or via the Crescent Harbor Road) compared with future year 2020 No Action estimated travel time of 238 minutes.
- Travel time savings would be significant on SR 20 to Mount Vernon and to Anacortes from Oak Harbor, at 21-23 and 16-17 minutes, respectively, showing a range for the Fakkema Road and Crescent Harbor Road alignments.
- Travel time savings would be significant between Oak Harbor and Everett either via SR 20 (36 to 40 minutes) or via the new bridge (47 to 59 minutes). The ranges shown reflect the Fakkema Road and Crescent Harbor Road alignments, respectively.
- Under a toll bridge operation, year 2020 PM peak hour operation on SR 20 at the Deception Pass Bridge would be LOS F, with LOS B on the new bridge.

SUMMARY OF FEASIBILITY MEASURES

Bridge from Strawberry Point on North Whidbey Island to North Stanwood

DESCRIPTION OF ROUTE

East from SR 20 on new alignment to Crescent Harbor Road, follow Crescent Harbor Road to new alignment to Strawberry Point Road, then a 6-mile bridge over Skagit Bay heading southeast to SR 530 on new alignment, then east along 300th Street NW to I-5 interchange.

SOCIAL IMPACTS

- Three hunter-fisher-gatherer archaeological sites are located within 0.5 mile of the alignment and would require evaluation. No historic archaeological sites were identified.
- No historic structures were identified within 0.5 mile of the alignment.
- Approximately 1,391 residences lie within the 0.5 mile of the alignment; 1,180 on Whidbey Island and 211 in Snohomish County. An estimated 87 residences and 4 businesses lie within the proposed 200' right-of-way required for the project.
- Existing roadways along the alignment would be upgraded to major arterial classification with a 50 mph speed limit including Crescent Harbor Road and 300th Street NW.
- Side street intersections would be primarily stop controlled and access to the new facility would be maintained comparable to existing. Limited access would be required near the toll plaza facility, with minor rerouting of traffic.

ENVIRONMENTAL IMPACTS

Significant impacts are expected with this alternative on Federally listed threatened and endangered species as follows:

- Two salmon-accessible streams would be potentially affected by the alignment.
- Three bald eagle nests in three bald eagle territories are within 0.5 mile of the alignment.
- Two and one-half mile of estuarine habitat in Skagit Bay would be potentially affected by the alignment. These areas are recognized as important wintering and staging habitat for waterfowl, spawning/rearing habitat for threatened chinook salmon, proposed threatened bull trout, and as spawning/rearing habitat for herring and smelt.
- Of the 2.5 mile of estuarine habitat crossed by the bridge, approximately 0.3 mile are through eelgrass habitat; an important habitat critical for supporting several priority fish species and other marine life.
- These impacts would present serious obstacles for obtaining approval by the US Fish and Wildlife Service and National Marine Fisheries Service.

- At least 60 emergent and forested wetland areas and open water habitat would potentially be affected by the alignment. One of the emergent wetlands is a large system (80+ acres) recognized by Washington Department of Fish & Wildlife as a State priority habitat. Adequate mitigation may be achieved through avoidance and minimization measures.

LAND USE AND ECONOMIC DEVELOPMENT IMPACTS

- Approximately 16 acres of agricultural land would need to be acquired for right of ways; none in Island County and 16 acres are in Snohomish County.
- Approximately 2.5 mile of new roadway would be located in shoreline areas under Snohomish County jurisdiction, including tidelands. Crossing of tidelands, shorelands, and marshes, bogs, or swamps for roads and railroads is prohibited by the County unless no viable upland alternative exists (Section 18, Snohomish County Shoreline Management Program).
- Construction would occur in designated Island County shoreline areas. The Island County Shoreline Master Programs stipulates that roadway construction shall be located away from shoreline areas whenever feasible.
- Shorelines of Statewide Significance that would be affected include the marine shoreline of Skagit County, Island County and Snohomish County in the project vicinity. Shorelines of Statewide Significance are given higher priority for protection and preservation than other designated shoreline areas.
- Approximately 22 farms and 11 businesses are located within a 0.5 mile of the alignment.
- The bridge would cross commercial and tribal crab and fish harvesting areas.

FINANCIAL FEASIBILITY

- Planning Level Construction Cost Estimate: $260.3 million including roadway, bridge, right of ways, and traffic mitigation.
- Signal upgrades at the I-5 interchange are included in the conceptual cost estimate. Signalized control at SR 20 is included in the conceptual cost estimate. Other signalized intersections may include SR 530 and key intersections along Crescent Harbor Road.
- Operations and Maintenance costs for the project are estimated to be $1.417 million annually.
- Project level rate of return would range from 5.8 to 6.6%, which would not be attractive to investors.

TRANSPORTATION PERFORMANCE

- An eleven-minute reduction in system average travel time is estimated between Oak Harbor and Mount Vernon compared with future year 2020 No Action estimated travel time of 90 minutes.
- A nine-minute reduction in system average travel time is estimated between Oak Harbor and Anacortes compared with future year 2020 No Action estimated travel time of 72 minutes.

- A ninety-six-minute reduction in system average travel time is estimated between Oak Harbor and Everett compared with future year 2020 No Action estimated travel time of 238 minutes.
- Travel time savings would be significant on SR 20 to Mount Vernon and to Anacortes from Oak Harbor, 22 and 16 minutes, repsectively.
- Travel time savings would be significant between Oak Harbor and Everett either via SR 20 (44 minutes) or via the new bridge (71 minutes).
- Under a toll bridge operation, year 2020 PM peak hour operation on SR 20 at the Deception Pass Bridge would be LOS C with low toll and LOS E with high toll, with LOS C-D on the new bridge.

SUMMARY OF FEASIBILITY MEASURES

Ferry From Whidbey Island to Vicinity of North Stanwood

DESCRIPTION OF ROUTE

A ferry run from Whidbey Island to a terminal located at the west end of a bridge extending out into Skagit Bay. The ferry would depart from a new ferry terminal located near either Strawberry Point, or Oak Harbor, or downtown Coupeville. The eastside ferry terminal would be located on a 5.4-mile bridge/dock aligned with an 0.8-mile extension of 300th Street NW in the vicinity of North Stanwood.

SOCIAL IMPACTS

- One hunter-fisher-gatherer archaeological site near the proposed Strawberry Point terminal, or four hunter-fisher-gatherer sites near the proposed Oak Harbor terminal, or approximately 30 sites along the shores of Penn Cove are located within 0.5 miles of the alignment and would need evaluation depending on the location of the terminal.
- Wave action from the ferry may adversely affect archaeological sites along Utsalady Point, Polnell Point, Maylor Point, and Penn Cove depending on the route.
- National Historic District: The proposed Coupeville ferry terminal might impact the Ebey's Landing National Historical Reserve, which includes Coupeville and portions of Penn Cove. This would raise Section 4F issues and permitting is not expected to be obtained for this ferry terminal location.
- Approximately 4 residences lie within 0.5 mile of the alignment in Snohomish County and all would potentially be affected by the proposed 200' right-of-way required for the project.

ENVIRONMENTAL IMPACTS

Significant impacts are expected with this alternative on Federally listed threatened and endangered species as follows:

- For all ferry route alternatives, two salmon-bearing streams would be potentially affected.
- Three bald eagle nests in three bald eagle territories are within 0.5 mile of the alignment.
- A two and one-half mile of estuarine habitat in Skagit Bay would potentially be affected by the bridge/dock alignment. These areas are recognized as important wintering and staging habitat for waterfowl, spawning/rearing habitat for threatened chinook salmon, proposed threatened bull trout, and as spawning/rearing habitat for herring, and smelt.
- Of the 2.5 mile of estuarine habitat crossed by the bridge/dock, approximately 0.3 mile are through eelgrass habitat; an important habitat critical for supporting several priority fish species and other marine life. Eelgrass beds are considered to be irreplaceable and avoidance is the recommended mitigation.

These impacts would present serious obstacles for obtaining approval by the US Fish and Wildlife Service and National Marine Fisheries Service.

- At least 60 emergent and forested wetland areas and open water habitat would potentially be affected by the alignment. Adequate mitigation may be achieved through avoidance and minimization measures.

LAND USE AND ECONOMIC DEVELOPMENT IMPACTS

- Sixteen acres of agricultural land in Snohomish County would be acquired for the ferry landing and along the 300th Street NW to SR 530 right of way.
- The 2.5 mile dock in the Stanwood vicinity would be located in intertidal wetlands in Snohomish County shoreline jurisdiction. These wetlands are designated and Priority Habitat by WDFW. Snohomish County shoreline regulations state "The location, design, construction and operation of boating facilities [including piers and docks] should endeavor to minimize any adverse affects on priority habitats, fish and shellfish resources, and the adjacent areas."
- Shorelines of Statewide Significance that could be affected include the Skagit Bay marine shoreline of Island County and Snohomish County in the project vicinity. Shorelines of Statewide Significance are given higher priority for protection and preservation than other designated shoreline areas.
- Four farms lie within 0.5 mile of the proposed alignment in Snohomish County.
- A ferry landing at Coupeville could adversely affect commercial and tribal shellfish harvest areas, depending on the location of the landing.
- Ferry traffic across Skagit Bay would cross fishing areas, potentially disrupt fishing activities, and could result in loss of fishing gear.

FINANCIAL FEASIBILITY

- Planning Level Construction Cost Estimate: Single ferry operation with landing at Strawberry Point - $221.7 million. Two ferry operation with landing at Oak Harbor or Coupeville - $297.7 million. These estimates include roadways, bridge/dock, right of ways, traffic mitigation, ferry vessel, and ferry terminals.
- Operations and Maintenance costs for the project are estimated to range from $7.8 million annually for the single ferry operation to Strawberry Point to $12.4 million annually for two ferry operation to either Oak Harbor or Coupeville.
- Project level rate of return for ferry operations was not evaluated, since ferry revenues are not expected to cover annual ferry operating costs, much less repay the construction or capital costs of the alternatives.

TRAVEL TIME BENEFITS

- A one-minute ***increase*** in system average travel time is estimated for travel from Oak Harbor to Mount Vernon when departing from Strawberry Point compared to future year 2020 No Action estimated system average travel time of 90 minutes. When departing from Oak Harbor, the trip is estimated to be one minute less than the No Action time, and when departing from Coupeville, the trip is estimated to be four minutes longer than the No Action travel time.
- For all three possible ferry terminal locations, a three-minute reduction in system average travel time is estimated between Oak Harbor and Anacortes compared to future year 2020 No Action estimated system average travel time of 72 minutes.
- A thirty-six (or eighteen) minute ***increase*** in system average travel time between Oak Harbor and Everett is estimated when departing on the ferry at either Oak Harbor (or Coupeville). When departing from Strawberry Point, a 25-minute reduction in system average travel time is estimated compared to the future year 2020 No Action estimated system average travel time of 238 minutes between Oak Harbor and Everett.
- Year 2020 PM peak hour operation on SR 20 at the Deception Pass Bridge would be LOS F, with any of the ferry options. Ferry operation would be at capacity or LOS E.